RED PENN LANDFILL SUPERFUND SITE

RECORD OF DECISION

SEPTEMBER 19, 2000

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DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Red Penn Sanitation Company Landfill
Pewee Valley, Oldham County, Kentucky

STATEMENT OF BASIS AND PURPOSE

This document presents the remedial action decision made by the U. S. Environmental Protection Agency (EPA) regarding the Red Penn Landfill Site in Oldham County, Kentucky. The decision was made in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) and the National Oil and Hazardous substances Pollution Contingency Plan (NCP), based on the information contained in the Administrative Record for the site.

Kentucky Department of Waste Management (KDWM) is aware of EPA's decision not to conduct a CERCLA funded remedial action at this site as recorded in this document. In accordance with EPA's advice, KDWM has made appropriate arrangements with the responsible parties to close the landfill as necessary. KDWM has neither objected to nor concurred with EPA's final decision on the site.

DESCRIPTION OF THE REMEDY

Based on the results of the Remedial Investigation, including the risk assessment, conducted on the Red Penn Landfill, no CERCLA funded remedial action is necessary at the site to ensure that human health and the environment are protected. The landfill was permitted to process only domestic waste between 1959 and 1989, but unauthorized industrial waste was accepted as well.

Remedial Investigation indicated that the site contained hazardous materials but the levels of contamination and risk are below EPA's action levels. Because the landfill was abandoned without proper closure, EPA advised KDWM to prevent site conditions from deterioration by requiring the responsible parties to close the landfill properly. KDWM negotiated the landfill closure plan with the parties and approved their capping design in October 1999. The responsible parties began constructing the remedy under Kentucky's oversight in June 2000. The project is scheduled to be completed by the end of September 2000. This Record of Decision document completes EPA's action on the site and includes a recommendation to the Commonwealth to restrict the use of the site to activities that would not compromise the integrity of the landfill cap.

DECLARATION STATEMENT

EPA has determined that no Superfund action is necessary at this site to ensure the protection of human health and the environment. The current decision will not result in hazardous substances remaining on-site above health-based levels. Therefore, no five-year review will be conducted for the site.

Richard D. Green, Director
Waste Management Division

19 SEP '00

Date

1.0 SITE BACKGROUND

1.1 SITE LOCATION

The Red Penn Landfill Superfund Site is located approximately 1.5 miles southeast of Pewee Valley in Oldham County, Kentucky. As shown in Figure 1, Shelby County lies to the east and southeast of the site, and Jefferson County lies to the south and southwest. The property is bounded on the east and southeast by Floyds Fork Creek, and on the southwest by an un-named creek tributary which runs along Kentucky State Route 362. Hawley Gibson Road forms the northwest property line.

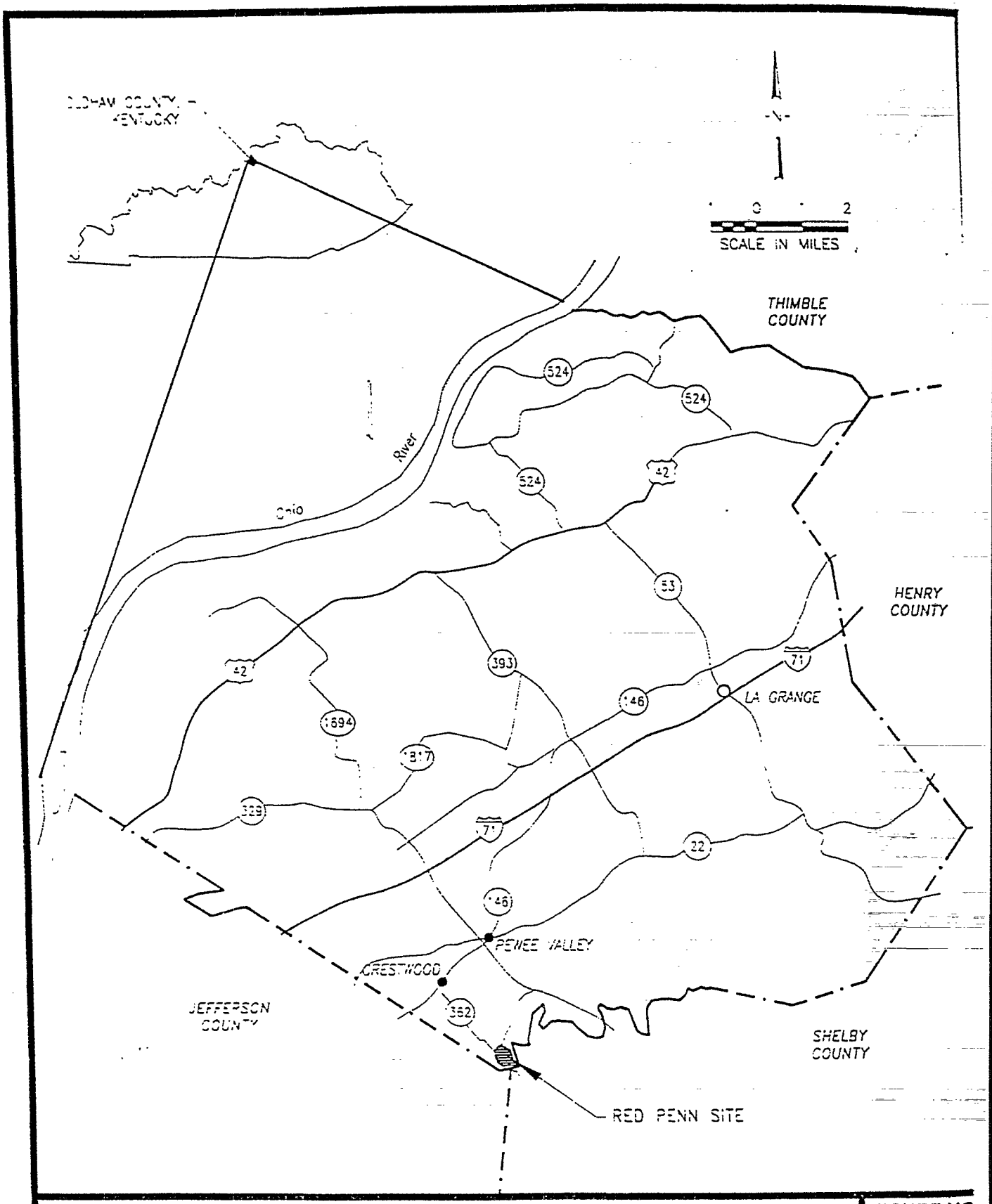
1.2 SITE DESCRIPTION

The landfill is contained in a rural parcel of land which is approximately 151 acres in size. The portion of the property permitted and actively used for waste disposal was 85 acres. The remaining 66 acres were used primarily as the borrow area from which cover soil was obtained during the landfill operations. The site is currently inactive and much of the property is overgrown with vines, shrubs and trees. The property is unfenced, but access roads have barricades which act as barriers to vehicular traffic. The physical structures remaining onsite include remnants of the old guard shack, and the maintenance building. A buried natural gas pipeline passes through the middle of the site, west of the landfill area, trending from northeast to southwest. Texas Gas Company owns the pipeline and maintains its corridor. See Figure 2 for site features.

2.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES

2.1 SITE HISTORY

The first documented waste disposal activity on this site occurred in 1954, when a 10-acre portion of the property was leased to Bert Logsdon and Chris P. Pennington for five years as a dump ground. In the lease, the parties agreed that the property would be used for the dumping of residential garbage only. The lease specifically excluded slop or carcasses of dead animals. The initial permit



ARCS IV

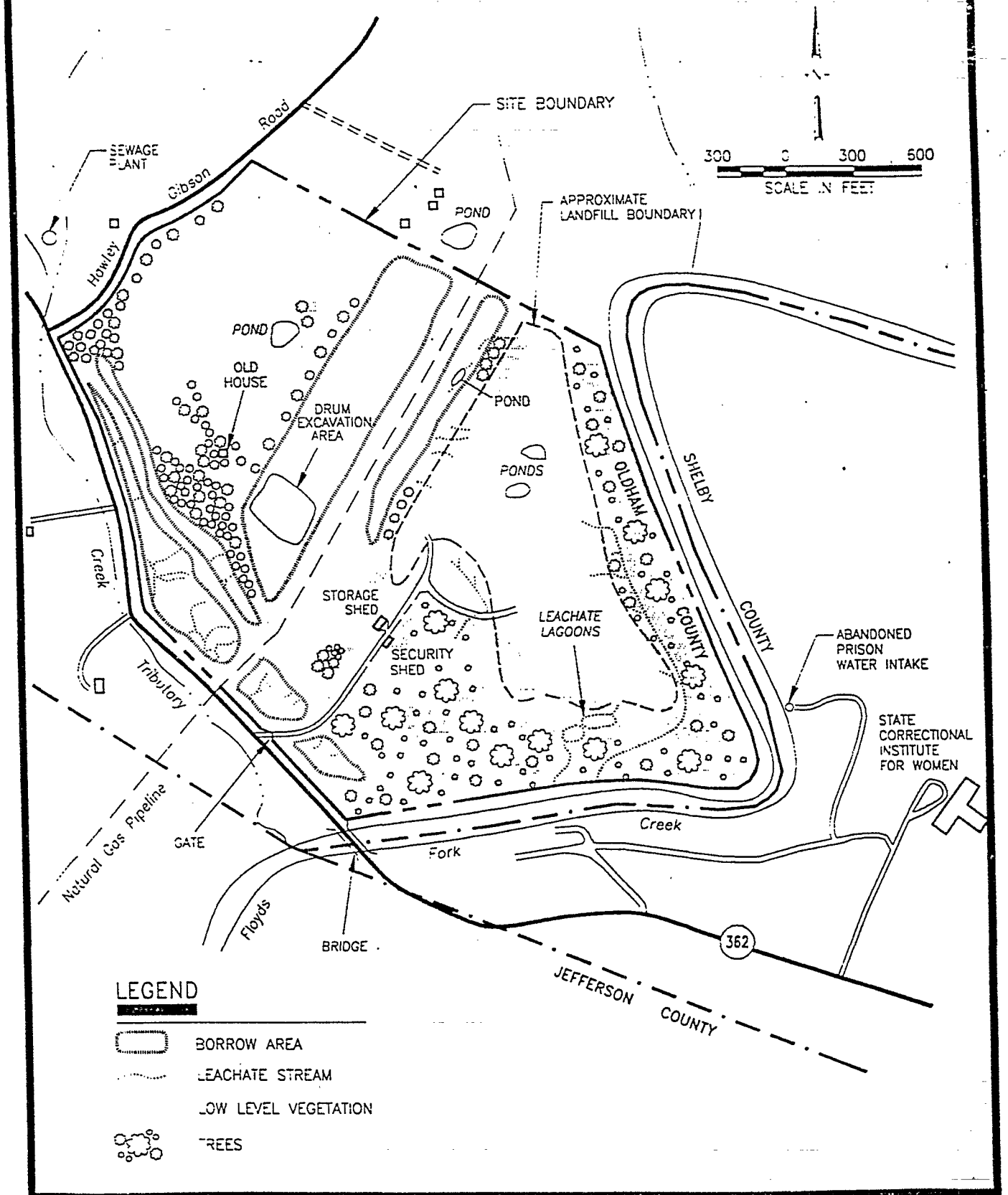
SITE LOCATION MAP

RED PENN SITE

PEWEE VALLEY, KENTUCKY

FIGURE NO

1



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SITE FEATURES MAP

RED PENN SITE

PEWEE VALLEY, KENTUCKY

FIGURE NO. 2

to operate a landfill at the site was issued by the Oldham County Health Department in 1959, to the Red Penn Sanitation Company. In 1968, the company obtained a solid waste disposal permit from the Kentucky Department of Health to use 85 acres of the property as a sanitary landfill. Although the permit excluded industrial wastes, Red Penn Sanitation Company contracted to accept industrial rubbish and sludge from the Louisville Scrap Material Company for disposal at the site in 1972.

Subsequently, the Red Penn site was inspected regularly by the Kentucky Division of Solid Waste which later became known as the Division of Hazardous Material and Waste Management, and is now called the Kentucky Division of Waste Management (KDWM). KDWM's files for this site indicate that violations of state and local regulations by the operator were frequent. Between 1972 and 1982, Red Penn Sanitation was cited repeatedly for improper operational problems, including creek pollution from overflowing leachate collection ponds, cover soil deficiencies, and consistently unsatisfactory site conditions.

In November 1982, KDWM discovered through discussions with Robert Layer, an independent Red Penn contractor that he had hauled several thousand drums of waste from the Anaconda Wire and Cable Company in LaGrange and dumped them in the landfill between 1967 and 1974. These drums allegedly contained waste enamels, drawing solution from the curing of copper wire, and possibly scrap varnish. Based on the information provided by Mr. Layer, KDWM estimated the number of drums dumped in the landfill to be at least 5400. Apparently, the drums were unloaded from his truck near the operating cell of the landfill and spread out over the landfill by the bulldozer operator at the site. Mr. Layer claimed that the drums were never empty. Fifteen drums were also taken to his own property where the contents were burned and the drums used as garbage cans . In addition, approximately 100 drums were taken to a Jim Sanders' property on Dawkins Road in Oldham County.

In April 1987, KDWM discovered through an interview with Mr. Donald Puckett, a former bulldozer operator at the landfill, that several drums containing paint waste and sludge generated by the Ford Motor Company plant in Jefferson County were dumped in the landfill between 1968 and 1974.

Based on the information provided by Mr. Puckett, KDWM estimated the number of drums dumped in the landfill to be at least 7800. Approximately 100 drums were also taken to Mr. Puckett's own property.

2.2 ENFORCEMENT ACTIVITIES

In March 1986, John Guelda, a part owner of the Red Penn Sanitation Company who bought half interest in 1979, notified KDWM that suspected hazardous waste had been found at the site. Upon inspection, KDWM found several drums and a pile of contaminated soil which had been excavated from the borrow area and dumped at the entrance of the landfill. Several drums were also found protruding from the excavation area. Two soil samples were collected from the drum and the pile at the entrance to the site during the inspection. Limited chemical analysis of the samples revealed the presence of toluene and xylene at concentrations of 153 and 62.5 milligrams per kilogram (mg/kg), respectively.

In 1986, KDWM conducted a preliminary assessment of the site and concluded that a site investigation was appropriate. The site investigation was conducted later in the same year. Samples of soil and wastes from the site, surface water and sediment from the Floyds Fork Creek, and groundwater from the site and private wells were analyzed for the entire list of priority pollutants. In addition, air sampling and magnetometer surveys were conducted. Several pollutants from industrial activities were detected in the various samples at significant levels of concentration particularly, metals, pesticides and volatile organic compounds. No readings above the background were observed from the magnetometer survey. Therefore, the extent of suspected drum burial could not be ascertained.

Based on the results of the site investigation, KDWM filed a Request for Appropriate Action and a Notice of Violation against the Red Penn Sanitation Company in 1986. The company agreed to clean up the drum excavation area and the pile of waste at the landfill entrance. In September and October 1986, approximately 207 cubic yards of contaminated soil and 85 drums (a total of about 154 tons

of material) were removed from the two locations by the Red Penn Sanitation Company under the direction of EPA's Emergency Response contractor. Upon completion of the removal action, KDWM collected and analyzed random soil samples from the excavation area and determined that further soil removal was necessary at the site. Red Penn Sanitation was ordered to conduct the additional removal work but defied the order. The permit to operate the landfill expired in December 1986. Although the company ceased operating the facility, the landfill was not properly closed. In April 1987, the Kentucky Natural Resources and Environmental Protection Cabinet (KNREPC) issued letters to several parties, notifying them that they were responsible for disposal of hazardous substances at the site. The letters requested voluntary participation by these parties in investigating the site, proposing a remedial plan, and implementing an acceptable remedial action.

The site was scored by the State in late 1987, and listed as a National Priorities Site by EPA in 1989, based on a score of 38.1 using the Hazard Ranking System. The high score was driven primarily by the groundwater and surface water pathways. A major source of drinking water in the area is the Laurel aquifer which is shallow (21 feet), is highly permeable due to karst features and is exposed at the landfill. Floyds Fork Creek is a major stream which served as the source of potable water for approximately 250 inmates and staff at the nearby women's reformatory. The creek also supports recreational fishing in the area.

EPA conducted a search of the entities associated with the dumping of unauthorized waste at the landfill and identified several potentially responsible parties (PRPs) in 1988. Notice letters were sent to the parties in February1989, to inform them of their potential liability, request additional information from them, and to advise them that EPA was considering spending public funds to conduct Remedial Investigation/Feasibility Studies (RI/FS) at the site. On June 19, 1989, two of the PRPs (Ford Motor Company and Waste Management, Inc.) met with EPA staff to discuss the possibility of a PRP lead RI/FS. EPA's conclusion from the discussions was that no PRP was interested in funding the studies. Therefore, a fund-lead RI/FS was initiated in late 1989.

In July 1993, EPA concluded from its RI studies that a Superfund remedial action at the site could not be justified. However, because the landfill was not properly closed, EPA advised KDWM to

solicit the PRPs to conduct a corrective action at the site under its authority. KDWM acted accordingly. In August 1994, the PRPs submitted a draft scope of work to the Commonwealth for capping the landfill. After revising the proposal several times, it was finalized in May 1998. Following an extensive negotiation, the Commonwealth and several PRPs entered into an Agreed Order in August 1999, requiring the PRPs to implement the remedial plan for the landfill. Pursuant to the provisions of the Agreed Order, the design for site remediation was prepared by the responsible parties and approved by KDWM in October 1999. The PRPs began construction of the remedy in April 2000, under the Commonwealth's authority and oversight.

3.0 COMMUNITY PARTICIPATION HIGHLIGHTS

The community relations program for the site began in June 1991, prior to starting the Remedial Investigation (RI) field work. EPA personnel interviewed the city and county officials, civic leaders, and area residents to determine their concerns and understanding of site issues. In addition, the interviews provided a basis for developing a comprehensive community relations plan for the site. Those interviewed were informed of the Superfund process and how it would be applied at the Red Penn site beginning with the pending Remedial Investigation and Feasibility Studies (RI/FS). The door to door interviews were held on June 3 and 4,1991. The local library, South Oldham Library in Crestwood, was visited during the interview, and established as one of two information repositories for the site. The other repository was the EPA record center in Atlanta, Georgia. Establishment of the repositories was announced to the public early in the process, and information at both places was updated as necessary.

Several Fact Sheets were published to inform the public about EPA activities on this site. The first one, published in August 1991, reviewed site history and the work being planned for the site by EPA, particularly the RI/FS. The second Fact Sheet was written in May 1993, to review EPA's work progress. An analysis of site evaluation, and the results of risk assessment were reported in a July 1993 Proposed Plan Fact Sheet which also announced that EPA could not justify a Superfund Remedial Action at the site. A second Proposed Plan Fact Sheet was published in April 2000, to re-state why Superfund cleanup could not be conducted at the site and to inform the public that the

responsible parties were in the process of conducting the necessary landfill closure under Kentucky's authority and supervision.

KDWM also issued three fact sheets on the site between August 1994 and April 2000. The first fact sheet informed the public that the Commonwealth of Kentucky would exercise its independent authority to effect a corrective action at the site by working directly with the potentially responsible parties. The second issue was published in November 1999, to discuss the progress of negotiation between the Commonwealth and the responsible parties. In April 2000, Kentucky's third fact sheet was published to discuss the remedial action construction which the responsible parties were about to begin at the site.

In addition to the fact sheets, EPA and KDWM conducted several meetings between September 1991 and April 2000, to discuss the site with the public. The meetings were attended by federal, state, county, and city officials, environmental activists, responsible parties, area residents and members of the local news media. Appendix A includes the transcript of the Proposed Plan Public Meeting held on April 20, 2000.

In summary, public participation in the Red Penn Landfill site events was promoted actively by both EPA and KDWM. In turn, the public indicated a high level of interest in site activities. To encourage the public to review and understand the technical issues and documents related to the site, availability of the Technical Assistance Grant was announced at the beginning of the project. However, no applications were received for the grant.

4.0 CURRENT AND POTENTIAL SITE RESOURCE USE

4.1 DEMOGRAPHICS

There are three towns within a 4 mile radius of the Red Penn landfill. These are Pewee Valley, Crestwood, and Anchorage with a combined population of approximately 4,800 people according to the 1990 census. Pewee Valley is located at approximately 1.5 miles, northwest of the site and

has a population of approximately 1,283 people. Crestwood is 2.5 miles north of the site and has an estimated population of 1,435 people. Anchorage has a population of 2,082 people and is located at 3.5 miles southwest of the site. Several residences that are not considered parts of these towns, constituting some 2,200 people, are estimated to be within four miles of the site.

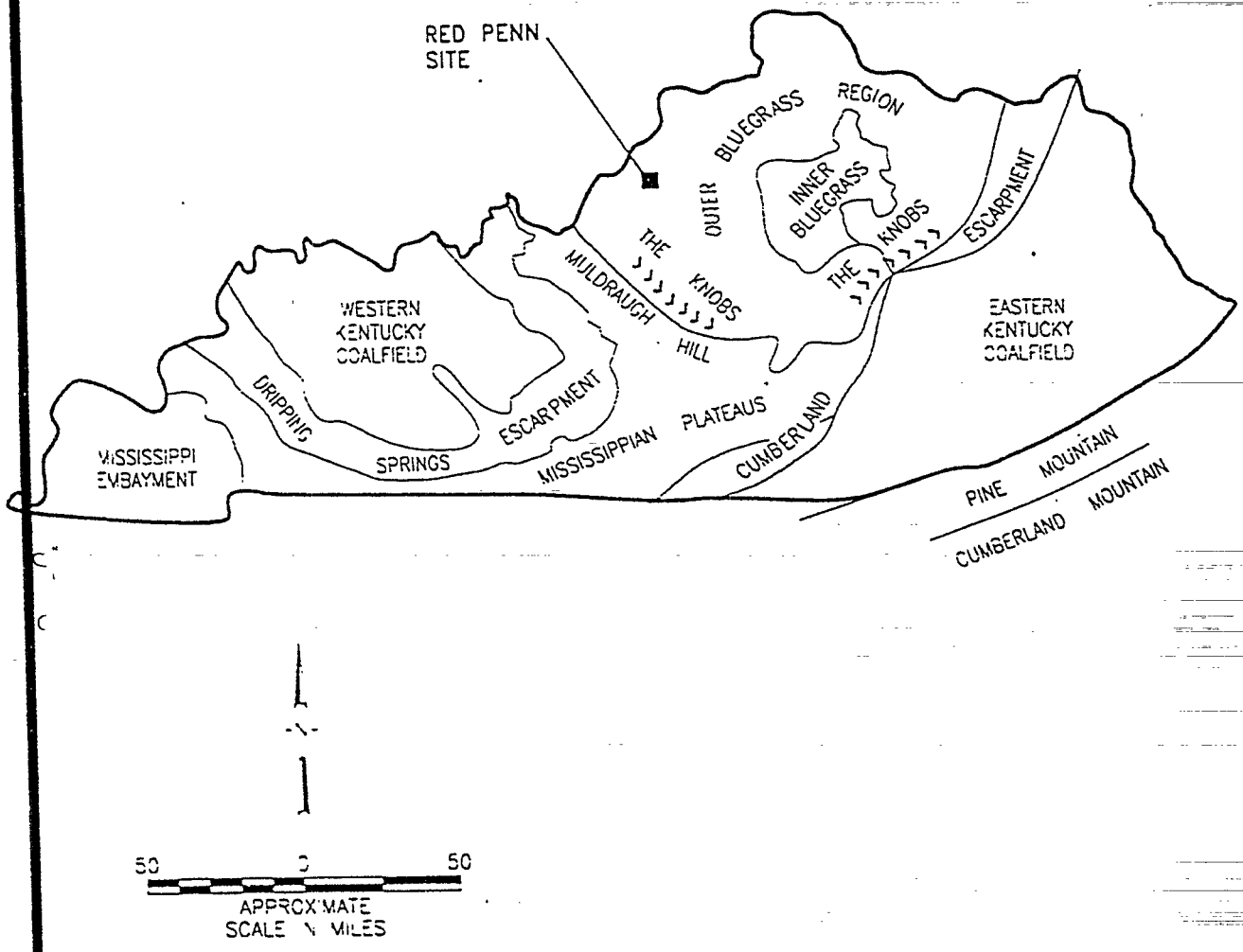
4.2 LAND USE

Land around the site is used primarily for agricultural and residential purposes. Agricultural activities include raising of crops and livestock. No parks or recreational areas are within a close proximity of the site. The property containing the landfill is designated for mix-use by the Oldham County Comprehensive Development Plan published in 1982. Development of the Red Penn property through year 2000 is planned to include commercial and office buildings, and medium to high density residences. The surrounding area is planned for low density residences. The Floyds Fork Creek which supports an active recreational fishing is designated as a resource protection item in the plan.

5.0 SUMMARY OF SITE CHARACTERISTICS

5.1 PHYSIOGRAPHY

As shown in Figure 3, Oldham County is located in the Outer Bluegrass Physiographic Province of Kentucky. The county consists of gently rolling to hilly terrain with upland elevations ranging from 650 feet above mean sea level (msl) in the western part, to 900 feet above msl in the eastern part. The Ohio River marks the northwest border of the county. In the western part of the county, wide expanses of gently rolling to nearly flat land are present. In the eastern part the terrain is dissected by several streams and is noticeably hilly. A few ridges are flat-topped, with the width of the ridges increasing westward in the county. Local relief is slight in the county except near Floyds Fork Creek, which has carved a valley 150 to 200 feet below the surrounding upland in some areas.



SOURCE: McGrain and Currens, 1978.

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PHYSIOGRAPHIC REGIONS OF KENTUCKY

RED PENN SITE

PEWEE VALLEY, KENTUCKY

FIGURE NO

3

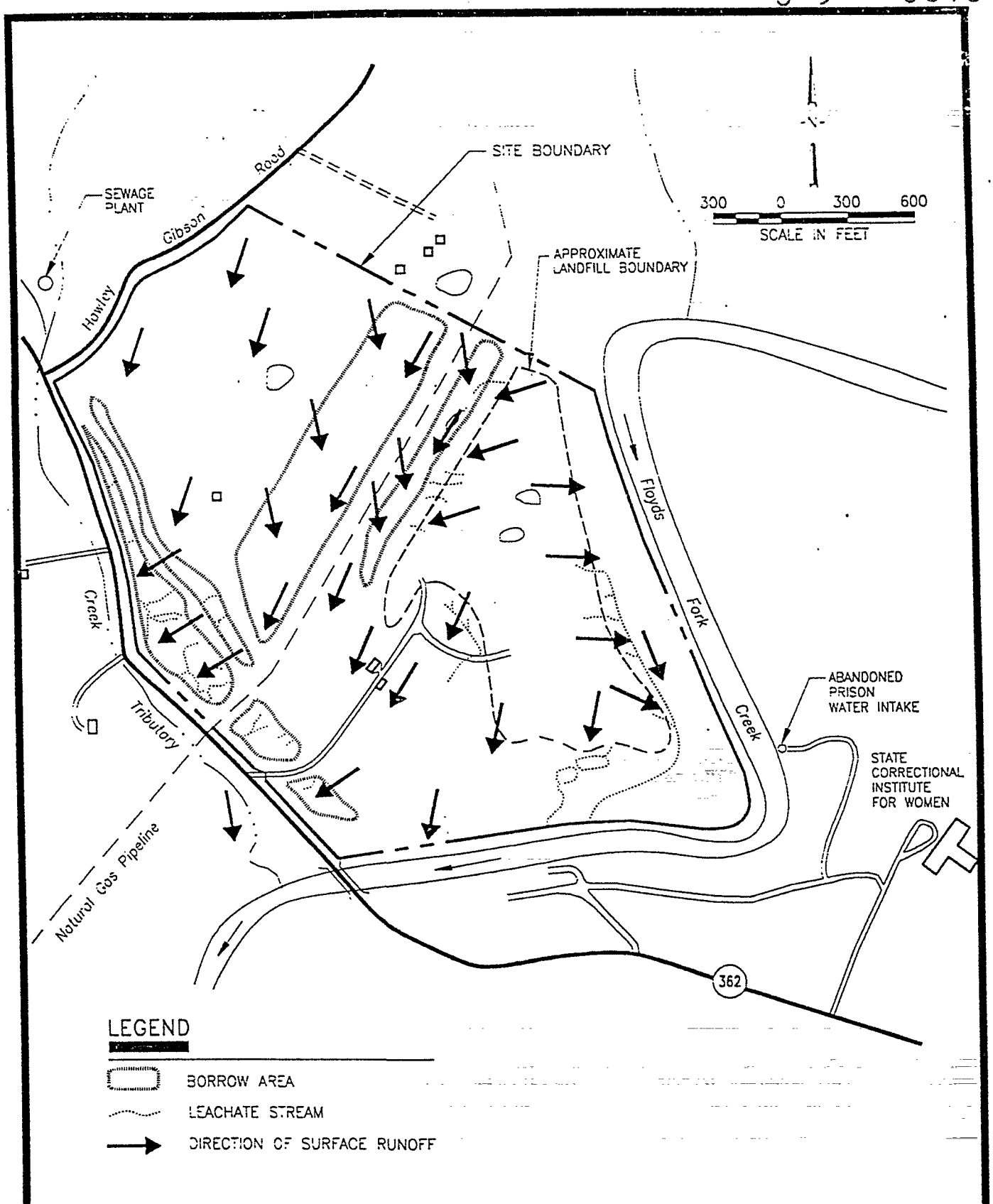
5.2 TOPOGRAPHY

The topography at the site has been altered significantly due to years of filling and borrowing activities. A review of the original (pre-development) topographic contours of the area during the RI indicated that a north-south trending drainage swale dissected the center of the property formerly and provided drainage into the Floyds Fork Creek. Presently, however, there is at least 50 feet of fill over this drainage swale. As part of the RI, a ground survey of the site was conducted and aerial photographs were obtained. The ground survey was conducted to locate a 100 foot sample grid over the entire 85 acres of the landfill and a 200 foot sample grid over the remainder of the property. The aerial photographs were utilized in conjunction with the ground survey to define current topography and to produce study base maps.

The crest of the landfill is approximately 700 feet above msl and approximately 100 feet above Floyds Fork Creek. Because the landfill is mound shaped, surface runoff occurs at the site radially and then proceeds south, east, or west towards the creeks along the site boundary. See Figure 4. To control the direct discharge of runoff from the site into the creek, a system of berm and catchment basin was constructed by the landfill operators. As shown in Figure 5, the site is not within the 100-year flood plain.

5.3 SURFACE HYDROLOGY

The surface waters potentially affected by the site are Floyds Fork Creek and the creek tributary. The creek tributary is approximately 10 feet wide where it borders the site and appears to be normally less than 1 foot deep based on observations made during the RI. The tributary flows southwest into the Floyds Fork Creek. Floyds Fork Creek is a perennial. It is a southwest flowing fork of the Salt River and is approximately 20 feet wide where it borders the site. Its depth is normally about 1 to 2 feet deep. However, high water marks of 6 or more feet above the stream banks were observed during site visits for this study. The Salt River is located approximately 12 miles south of the site. It flows



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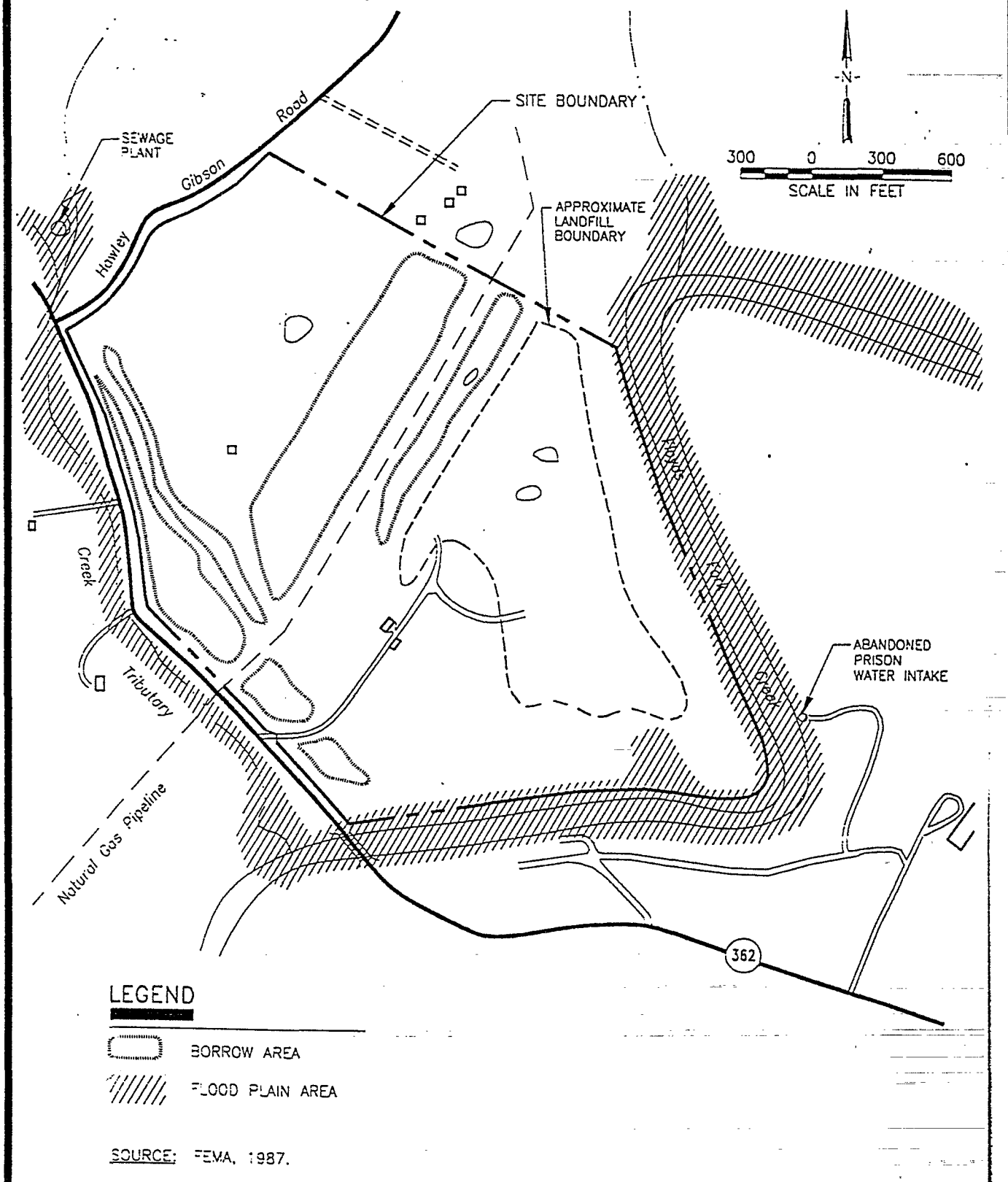
SURFACE RUNOFF PATHWAYS

RED PENN SITE

PEWEE VALLEY, KENTUCKY

FIGURE NO. 4



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100-YEAR FLOOD PLAIN

RED PENN SITE

PEWEE VALLEY, KENTUCKY

FIGURE NO. **5**

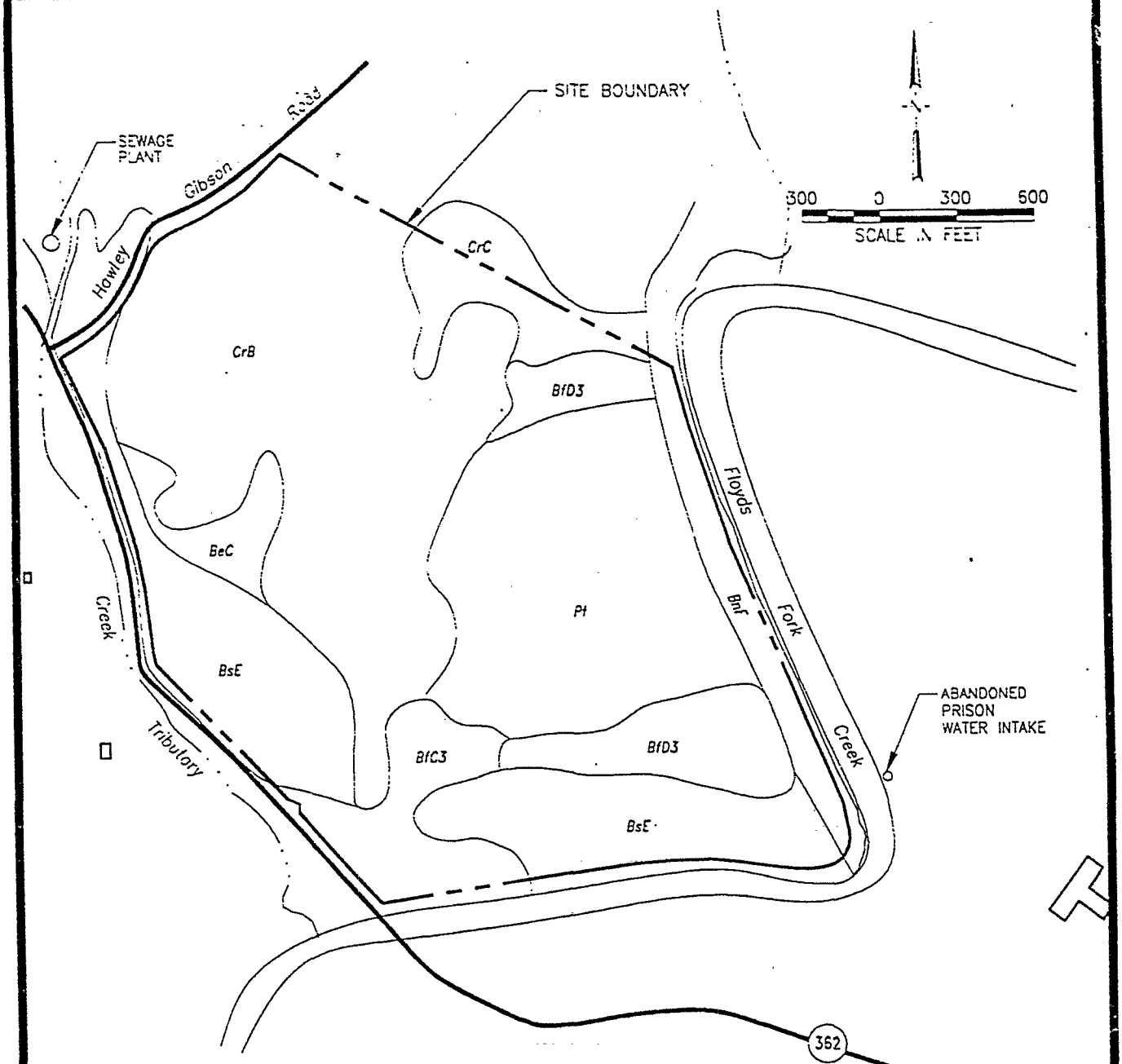
westward into the Ohio River. The U.S. Geological Survey (USGS) has a permanent stream gage on Floyds Fork Creek located approximately four miles upstream from the site and monitors the creek's rate of flow. A review of the USGS record indicated that during the dry season, Floyds Fork Creek may dry up or its flow rate may be too small to measure.

5.4 SOILS

Soil depth at the site varies from 0 to 12 feet. The soil type distribution at the site, according to the Soil Survey of Oldham County which was conducted in 1975, is shown in Figure 6. It is noteworthy that the soil type distribution depicted by the figure is representative of conditions as they existed prior to 1975. Due to land filling and borrowing activities since then, these conditions may have been altered. Nevertheless, the map provides a general indication of the types of soils present at the site.

5.5 GEOLOGY

Oldham County lies within the Ohio Geological Region which is made up of a series of bedrock units. The bedrock series vary greatly in thickness and hydrogeologic characteristics, and range in age from Precambrian to Tertiary. Two basins, the Appalachian and the Illinois, are the most conspicuous structural features in the area. These basins are separated from each other by the Cincinnati, the Findlay, and the Kankakee arches, and the Nashville dome. The surface of the basement complex slopes from the arch areas toward the Appalachian and Illinois basins. This slope is the key geologic feature controlling the strike and dip of the younger bedrock series overlying the basement complex. These younger units form the bedrock aquifer system. Oldham County lies on the western flank of the Cincinnati arch. The dip of the younger bedrock west of the Cincinnati arch and south of the Kankakee arch is generally toward the low point of the Illinois basement depression. Local geologic structures in the counties surrounding the site can be described as a series of synclines and anticlines, generally plunging to the west-southwest. The axis of the Lyndon Syncline, a local structural feature, traverses the central section of the site. Strike and dip measurements on the rock units outcropping at the surface indicate that the site is situated on a very gentle swale of the syncline. The dip of the



SOIL LEGEND

BeC	BEASLEY SILT LOAM, 6 TO 12% SLOPES
BfC3	BEASLEY SILTY CLAY LOAM, 6 TO 12% SLOPES, SEVERELY ERODED
BfD3	BEASLEY SILTY CLAY LOAM, 12 TO 20% SLOPES, SEVERELY ERODED
BnF	BEASLEY-CANEYVILLE ROCKY SILT LOAMS, 30 TO 60% SLOPES
BsE	BRASSFIELD-BEASLEY SILT LOAMS, 20 TO 30% SLOPES
CrB	CRIDER SILT LOAM, 2 TO 6% SLOPES
CrC	CRIDER SILT LOAM, 6 TO 12% SLOPES
Pt	PITS

SOURCE: SCS, 1977.

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SOIL TYPE DISTRIBUTION

RED PENN SITE

PEWEE VALLEY, KENTUCKY

FIGURE NO. 6

bedrock units is generally less than 3 degrees, and influences the surface-water flow direction. The formation underlying the site is made up of fine grained carbonates and shales. Alluvial deposits are also found along Floyds Fork Creek and its tributaries. These sediments are of Quaternary age flood plain deposits composed principally of sands, silts, clays, and gravels. The unconsolidated sediments are commonly 8 to 10 feet in thickness along Floyds Fork Creek. Figure 7 is a map of the site showing the locations where two schematic geologic cross-sections (A-A' and B-B') have been constructed. Section A-A' is an east-west cross-section which is shown in Figure 8. Section B-B' is a north-south cross-section depicted in Figure 9.

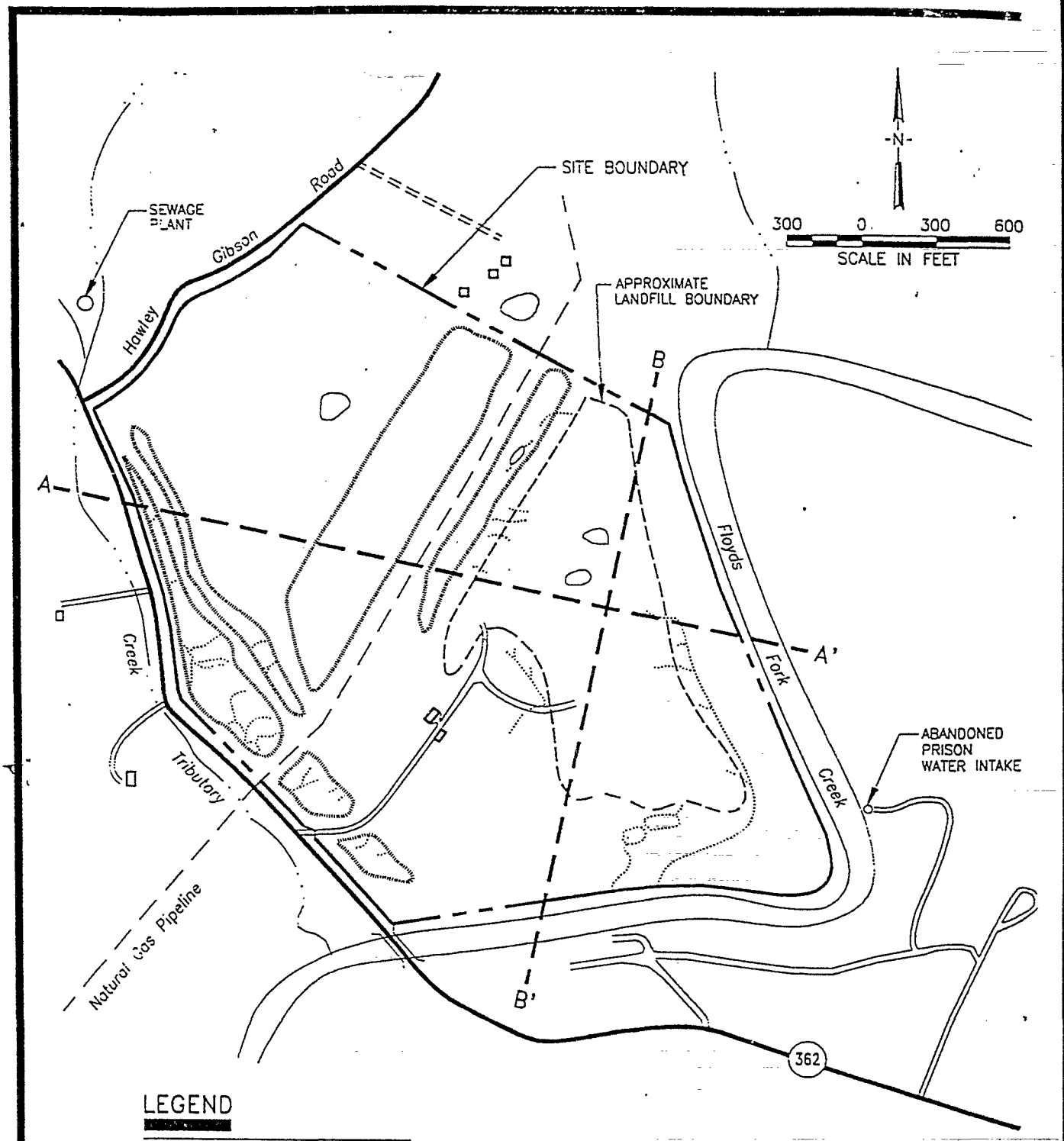
5.6 HYDROGEOLOGY

The occurrence and movement of ground water in this region appear to be controlled by three major factors. These are : (1) the fractures and solution-enlarged openings in the rocks, (2) the western-southwestern dip of the bedrock units, and (3) the creeks incising the bedrock aquifers. Generally, the limestone and dolomite beds transmit large quantities of water through openings along joints and bedding planes enlarged by solutioning. The shale beds, however, generally impede the upward and downward movement of water from the adjacent limestone and dolomite beds due to fewer and smaller fractures. The water bearing potentials of the stratigraphic units in the area are described below:

The Louisville limestone typically yields more than 500 gallons of water per day (gpd) to wells drilled in valley bottoms or along streams and broad uplands. At many locations, the limestone is highly porous and permeable along joints and bedding planes. Wells intersecting these openings usually yield a sustainable domestic supply of water. Springs are commonly found in the Louisville limestone just above the contact with the underlying Waldrom shale.

The Waldron shale yields little water. It tends to act as an aquitard which impedes recharge to the underlying Laurel dolomite.

The Laurel dolomite, is fine-grained. It crops out in valleys of south-flowing streams such as the Floyds Fork Creek. Karst features, including sinkholes and solution channels are common in this unit. The Laurel dolomite typically yields 100 to 500



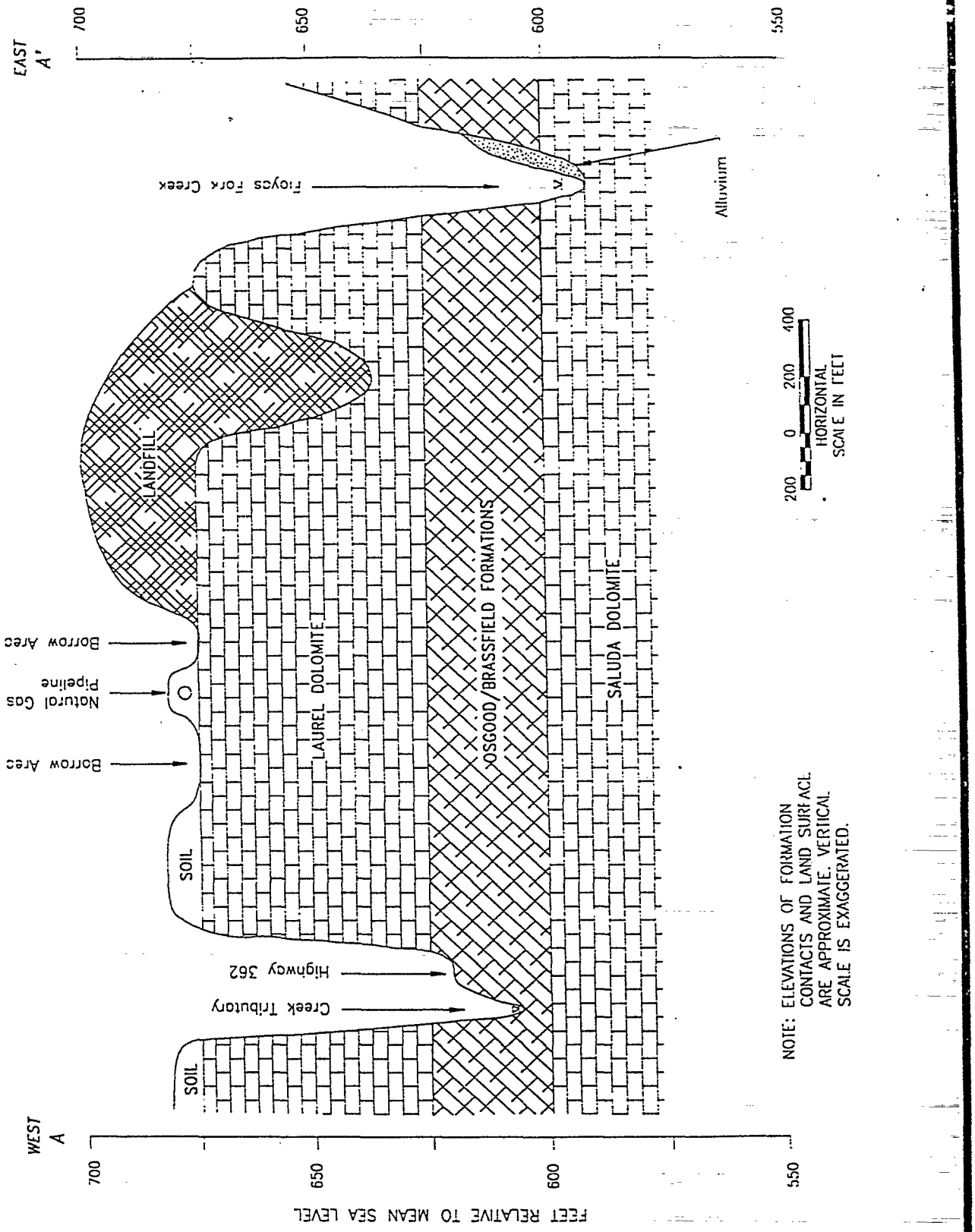
ARCS IV

GEOLOGIC CROSS-SECTION LOCATION MAP

RED PENN SITE

PEWEE VALLEY, KENTUCKY

FIGURE NO. 7



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GEOLOGIC CROSS-SECTION A-A'

RED PENN SITE

PEWEE VALLEY, KENTUCKY

FIGURE NO.

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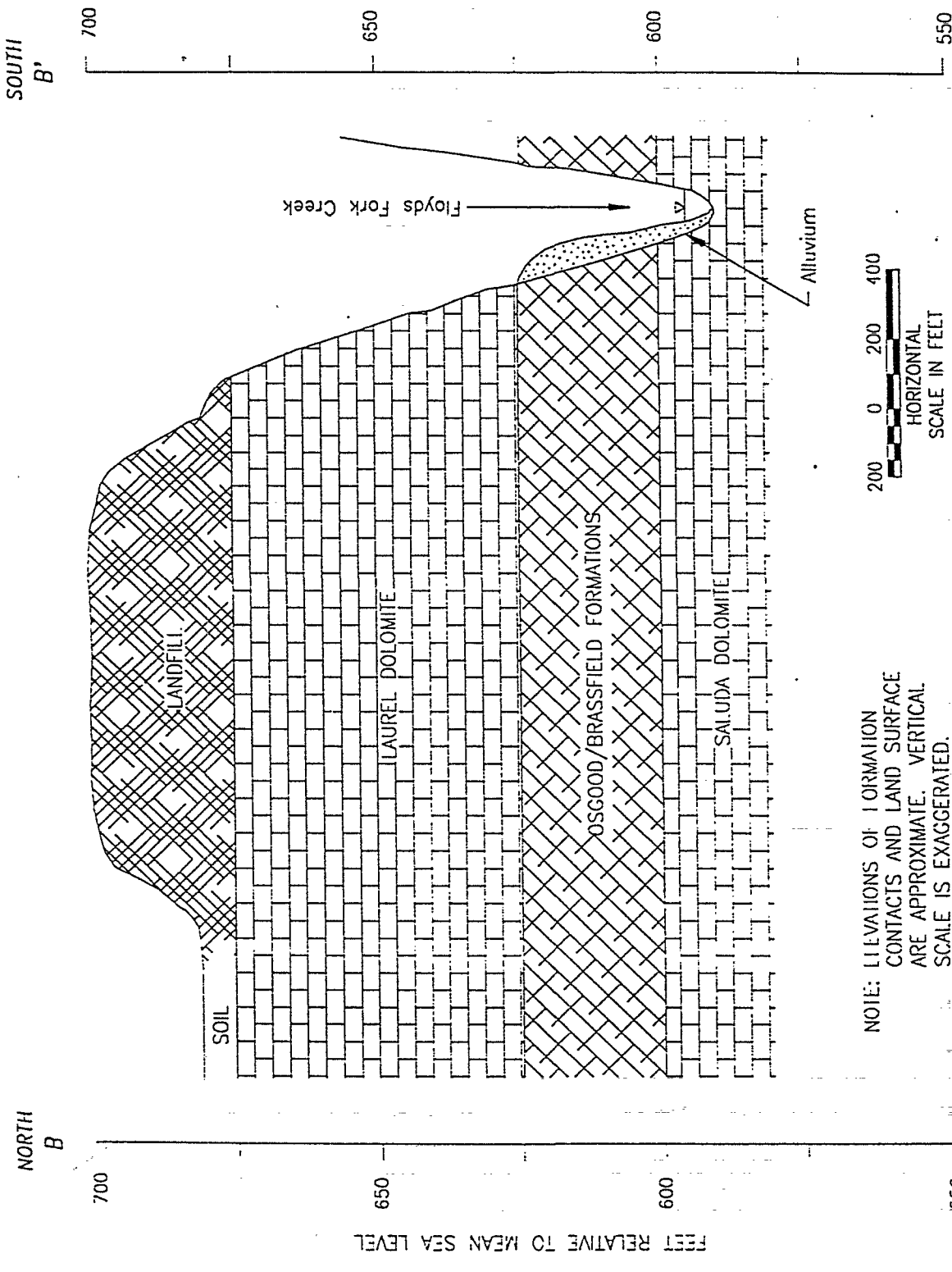

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GEOLOGIC CROSS SECTION B-B'

RED PENN SITE

PEWEE VALLEY, KENTUCKY

FIGURE NO.

9

gpd of water to wells located along streams. The unit, however, does not have sustainable yields of fresh water where it is extensively overlain by the Waldron shale.

The Osgood Formation underlying the Laurel dolomite consists of dolomitic shale, mudstone, and dolomite. The units yield little water to wells and impede recharge to the underlying limestones and dolomites. However, it yields water to small springs and seeps at locations where the contact between the dolomite and shale is exposed.

The Brassfield limestone underlying the Osgood Formation also yields water to springs. Karst features are common in this unit, however the formation is generally thin and has low capacity. Therefore, it is not a principal drinking water source in the area.

The Saluda dolomite is a member of the Drakes Formation which typically yields between 100 and 500 gpd of water to wells in valley bottoms such as near the Floyds Fork Creek. Karst features are common in the upper part of this formation but less common in the lower part.

In view of the above hydrogeologic characteristics, three major aquifers are potentially affected by the Red Penn Landfill. These are: the Louisville Limestone Aquifer, the Laurel Dolomite/Upper Osgood Formation Aquifer, and the Brassfield Limestone/Saluda Dolomite Aquifer. The first and second aquifers are separated by the Waldron shale, and the second and third aquifers are separated by the lower Osgood Formation aquitard. Around the site, a significant amount of the Louisville limestone and the Waldron shale has been eroded away, leaving the Laurel dolomite as the first formation encountered. The base of the Red Penn landfill lies on top of the Laurel dolomite, and leachate springs at the landfill have been observed to accumulate on top of the Osgood Formation beneath the Laurel dolomite. Therefore, the aquifers of primary concern at this site are the Laurel and the Saluda.

Generally, carbonate formations are potentially host to solution enhanced permeabilities and karst development which may present unpredictable and complicated groundwater flow patterns with variable transmissivities. These characteristics were observed at the site. Accordingly, the special technique of dye tracing was applied to study the groundwater flow pattern in the area. The following were the findings of the study.

- A vertical sequence of aquifers and confining layers exists at the site. The Louisville limestone represents a water-table aquifer extending down to the top of the Waldron shale, which is an effective confining layer. These units occur only at the most northern portion of the site and are not impacted by the landfill except by borrow activities.

- The aquifers of concern at the site are the Laurel and Saluda dolomites. While neither is a well-developed karst aquifer due to interbedding of shale and dolomite strata, they are anisotropic carbonate aquifers. The Laurel is a fractured dolomitic aquifer exposed at the land surface over most of the site. It exhibits a high degree of secondary permeability due to solution-enlarged joints and bedding-plane partings. While groundwater storage in the Laurel aquifer may be low, recharge occurring during wet periods travels at high velocity (on the order of 500 feet per hour) through discrete conduits in relatively narrow groundwater basins. The Osgood shales effectively limit downward percolation of groundwater from the Laurel aquifer into the Saluda aquifer, limiting dissolutional enlargement of fractures in the Saluda. Therefore, the Saluda is significantly less permeable than the Laurel. Both aquifers are gently folded by the west-southwest-plunging Lyndon Syncline, the axis of which bisects the site.

- Surface geophysical surveys conducted at the site detected no extensive areas of groundwater flow. However, the data indicated that flow of groundwater away from the landfill is limited to localized and discrete zones.

- Numerous small intermittent springs and several leachate streams flow from the landfill area into the Floyds Fork. However, due to structural control of groundwater flow by the west-southwest-plunging Lyndon Syncline, the greatest discharge occurs through the quarry springs which flow into the creek tributary. These springs occur primarily in the Laurel dolomite and are perched on the shaly Osgood Formation.

- Most groundwater flow from the site discharges through springs into Floyds Fork and the creek tributary. These streams are deeply incised and appear to form a local base level for

groundwater flow at the site. The dye-tracing investigation provided no evidence of groundwater migrating off site except via discharge into these streams.

6.0 SUMMARY OF SITE RISKS

EPA initiated sampling activities at the site in September 1989, primarily to assess current impact on the creeks especially because the nearby correctional institute obtained its drinking water from the Floyds Fork Creek. Surface water and sediment samples were collected and analyzed to determine the need for any emergency action. Although, toluene and heavy metals were detected in the samples, no emergency response was deemed necessary. Shortly after this event, RI began at the site.

6.1 REMEDIAL INVESTIGATION SUMMARY

During the RI, various studies were conducted to determine the nature and extent of site contamination. The studies included site sampling and laboratory analyses, evaluation of the risks potentially posed by site contamination to human health and the environment, and determination of site clean-up options. Details of the studies are in the Administrative Record and their results are summarized in the following sections.

6.1.1 Soil Gas Sampling

A passive soil gas survey was conducted to identify volatile organic compounds in the landfill and to determine potential source areas and migration pathways. Soil gas samples were collected from 222 grid points on and around the landfill. Results of the survey indicated presence of chemical compounds commonly found in solvents and fuel products primarily within the boundaries of the site. The results also indicated possible off-site migration of the compounds towards the creeks.

6.1.2 Surface Soil Sampling

Fifty-one soil samples were collected from and around the landfill to determine the chemical compounds of potential threat to human health due to direct contact. All samples were obtained from within one foot of the landfill surface and analyzed for complete target compound list/target analyte list (TCL/TAL). In addition, presence of cyanide was investigated . Several metals and cyanide were detected in the soil samples at low levels of concentration. The most predominant metals were chromium, iron, lead, vanadium, zinc, sodium, potassium, calcium and magnesium. Isolated occurrences of pesticides, polycyclic aromatic hydrocarbons and toluene were also reported.

6.1.3 Surface Water and Sediment Sampling

Surface water and sediment samples were collected from five locations along the Floyds Fork Creek, four locations along the creek tributary, and three on-site catchment basins. The samples were analyzed for TCL/TAL parameters and cyanide. Chloroform and bromodichloromethane were found in one surface water sample from the creek tributary and lindane was detected in a surface water sample from the Floyds Fork Creek. Sediments from the three on-site catchment basins showed the presence of PAHs. Concentrations of the contaminants found in the surface water and sediment samples were insignificant.

6.1.4 Groundwater Evaluation

Groundwater samples were collected from one up-gradient and two down-gradient domestic wells, two on-site monitoring wells, and one domestic source spring near the site. The samples were analyzed for chemical compounds of potential human health concern. No contaminants were found at significant concentrations in the wells with the exception of the up-gradient sample which showed the presence of lead and cadmium at elevated levels.

In addition to these samples which were collected by EPA contractors, Kentucky conducted a

confirmatory monitoring program to characterize seasonal fluctuations in contaminant levels. Groundwater was sampled quarterly over a period of one year between 1996 and 1997, under a cooperative agreement with EPA. Eleven on-site locations including two new wells, and one private well were sampled. Contaminants similar to those obtained during previous sampling efforts were obtained at levels within the ranges from previous laboratory results.

Groundwater flow and contaminant transport characteristics were evaluated using dye trace analysis. The analysis concluded that the primary aquifers underlying the landfill flow towards and discharge into the adjacent creeks. Consequently, landfill contaminants transported by the groundwater would be discharged into the creeks. However, sampling of the creeks indicated low contaminant concentrations. Furthermore, the dye trace study indicated that a confining layer exists above the deeper aquifer (Saluda) which would limit its contamination by the landfill.

6.1.5 Leachate Sampling

Several leachate springs, seeps, and ponds were found on and adjacent to the site during the RI. Six locations were chosen and sampled. The samples indicated the presence of several organic and inorganic compounds at varying concentrations which were determined to constitute a minimal threat to human health.

6.2 Summary of Human Health Risk Assessment

Human health risks posed by the Red Penn site were evaluated as part of the RI. The process of evaluation included: (1) identification of chemicals of potential concern at the site, (2) exposure assessment, (3) toxicity analysis, and (4) risk characterization.

6.2.1 Chemicals of Potential Concern

The RI field and laboratory activities were designed and conducted with proper quality control

measures to identify the chemical compounds associated with the site. Upon completing the activities, approximately sixty-six different chemicals were found at the site. A listing of the chemicals is presented in Table 1. A subset of the listed chemicals was selected as the contaminants of potential concern (COCS), by evaluating each chemical's toxicity, concentration, and frequency of occurrence. The COCS are cadmium, chromium, lead, cyanide, benzene, three isomers of benzene hexachloride (alpha, beta, gamma), bis(2-ethylhexyl)phthalate, and carbon disulfide. Rationales for selecting these chemicals are stated in Table 1.

6.2.2 Exposure Assessment

An analysis of potential human contact with the chemicals of concern at Red Penn was conducted. Site physical setting, fate and transport of the COCS, the potentially exposed populations, and all relevant exposure pathways were considered as detailed in the RI report. The various qualitative factors considered in the exposure assessment are outlined in the Conceptual Site Model of Figure 10. Exposure to COCS was expressed numerically and designated as Chronic Daily Intake (CDI). Quantitative factors used to calculate chronic daily intake for each COC, including reasonable maximum exposure, contaminant concentration, frequency, and duration of exposure, were based on worst case scenarios so as to derive conservative exposure information.

6.2.3 Toxicity Analysis

Toxicity analysis was conducted to evaluate the potential for cases of cancer and/other adverse human health problems as a result of exposure to each COC. The analysis was based on EPA's slope factors for carcinogenic effects and reference doses (RfDs) for non-carcinogenic effects. Results of the analysis are shown in Tables 2 and 3.

6.2.4 Risk Characterization

By integrating the results of exposure assessment and toxicity analysis, various cancer and non-cancer

TABLE 1

Occurrence and Distribution of Contaminants
Red Penn Site
Pewee Valley, Kentucky

Parameter	Media(1)	Control(2)	Range of Detects(3)	Average(4)	Frequency(5)	COC	Rationale for Inclusion or Exclusion
ALUMINUM	SS	5200 – 14000	1900 – 45000	10,600	41/41		
	LH	NA	430 – 4500	1100	5/6	No	Mean concentration less than 2 x background in all media.
	SD	11000	1600 – 17000	8000	11/11		No EPA toxicity values available.
	SW	3900	1200 – 4200	1500	5/9		
	GW	NA	280–2400	1340	2/2		
ANTIMONY	SS	ND(8.5–20)	2.5–3.3	2.8	3/41		
	LH	NA	ND(30)	NA	0/6	No	Less than preliminary remediation goal (PRG) for surface soil,
	SD	ND(30)	ND(20–30)	NA	0/11		(110 mg/kg).
	SW	ND(30)	ND(30–60)	NA	0/9		Not detected in other media.
	GW	NA	ND(30)	NA	0/2		
ARSENIC	SS	3 – 12	2.5 – 23	12.8	19/41		
	LH	NA	13 – 34	21	4/6	No	Less than 2 x background for surface soil and sediment.
	SD	80	3 – 78	40	10/11		Less than MCL (50) in leachate.
	SW	ND(30)	ND(3–30)	NA	0/9		Less than PRG for surface soil (274 mg/kg)
	GW	ND(30)	NA	NA	0/2		
BARIUM	SS	36 – 120	15 – 170	72	41/41		
	LH	NA	150 – 440	292	6/6	No	Less than MCL (2,000) in leachate.
	SD	420	21 – 440	210	11/11		Less than PRGs for surface soil (13,700 mg/kg) and leachate
	SW	63	63 – 300	120	6/9		(1,830 ug/L)
	GW	NA	27–98	63	2/2		
BERYLLIUM	SS	0.50 – 1.0	0.34 – 1.7	0.72	41/41		
	LH	NA	ND(1–5.0)	NA	0/6	No	Less than 2 x background in surface soil and sediment.
	SD	5.3	0.41 – 5.8	2.7	9/11		Not detected in leachate or surface water.
	SW	ND(5.0)	ND(1–5.0)	NA	0/9		
	GW	NA	ND(5.0)	NA	0/2		
CADMIUM *	SS	ND(0.48–1.5)	ND(0.41–1.5)	NA	0/41		
	LH	NA	9 – 13	10	3/6	Yes	Exceeds MCL (5) in leachate.
	SD	ND(5.0)	0.85–2.7	1.8	2/11		
	SW	ND(5.0)	3 – 6	4	5/9		
	GW	NA	ND(5.0)	NA	0/2		
CALCIUM	SS	800 – 150000	1000–150000	58,300	41/41		
	LH	NA	76000–145000	110000	6/6	No	Less than 2 x background in all media.
	SD	74000	8100 – 140000	75000	10/10		No EPA toxicity values available.
	SW	41000	41000– 72000	56000	9/9		
	GW	NA	48000–100000	74000	2/2		

TABLE 1 (continued)

Occurrence and Distribution of Contaminants
Red Penn Site
Pewee Valley, Kentucky

Parameter	Media(1)	Control(2)	Range of Detects(3)	Average(4)	Frequency(5)	COC	Rationale for Inclusion or Exclusion
4,4'-DDD (P,P'-DDD)	SS	ND(3.7-4.7)	6.4	6.4	1/41		
	LH	NA	ND(0.10-0.25)	NA	0/6	No	Less than PRG for surface soil (2,670 ug/kg).
	SD	ND(32)	ND(3.9-33)	NA	0/11		Not detected in other media.
	SW	ND(0.25)	ND(0.10-0.25)	NA	0/9		
	GW	NA	ND(0.20)	NA	0/2		
4,4'-DDT (P,P'-DDT)	SS	3.9 - 22	18	18	1/41		
	LH	NA	ND(0.10-0.25)	NA	0/6	No	Less than PRG for surface soil (1,880 ug/kg).
	SD	ND(40)	ND(3.9-41)	NA	0/11		Not detected in other media.
	SW	ND(0.25)	ND(0.10-0.25)	NA	0/9		
	GW	NA	ND(0.25)	NA	0/2		
BENZENE *	SS	ND(11-14)	ND(11-14)	NA	0/41		
	LH	NA	3.5-6.5	5.0	3/6	Yes	Exceeds MCL (5) in leachate.
	SD	ND(31)	ND(12-65)	NA	0/11		
	SW	ND(5.0)	ND(5.0-10)	NA	0/9		
	GW	NA	ND(5.0)	NA	0/2		
BENZO(A)ANTHRACENE	SS	ND(380-460)	92	92	1/41		
	LH	NA	ND(10)	NA	0/6	No	Less than PRG for surface soil (877 ug/kg).
	SD	ND(1600)	54	54	1/11		Less than Effects Range-Low (ER-L) for sediment.
	SW	ND(10)	ND(10)	NA	0/9		Infrequent, isolated occurrence.
	GW	NA	ND(10)	NA	0/2		
BENZO(B AND/OR K)-FLUORANTHRENE	SS	ND(380-460)	89	89	1/41		
	LH	NA	ND(10)	NA	0/6	No	Less than PRG for surface soil (877 ug/kg).
	SD	ND(1600)	88	88	1/11		Infrequent, isolated occurrence.
	SW	ND(10)	ND(10)	NA	0/9		
	GW	NA	ND(10)	NA	0/2		
BHC-ALPHA *	SS	ND(1.9-2.4)	ND(1.9-2.4)	NA	0/41		
	LH	NA	0.062	0.062	1/6	Yes	Exceeds PRG for leachate (0.00285 ug/L)
	SD	ND(7.9)	ND(2.0-8.1)	NA	0/11		
	SW	ND(0.10)	ND(0.05-0.10)	NA	0/9		
	GW	NA	ND(0.050-0.053)	NA	0/2		
BHC-BETA *	SS	ND(1.9-2.4)	ND(1.9-2.4)	NA	0/41		
	LH	NA	0.12	0.12	1/6	Yes	Exceeds PRG for leachate (0.00996 ug/L).
	SD	ND(16)	ND(2.0-16)	NA	0/11		
	SW	ND(0.10)	ND(0.05-0.10)	NA	0/9		
	GW	NA	ND(0.10)	NA	0/2		

TABLE 1 (continued)

Occurrence and Distribution of Contaminants
Red Penn Site
Powee Valley, Kentucky

Parameter	Media(1)	Control(2)	Range of Detects(3)	Average(4)	Frequency(5)	COC	Rationale for Inclusion or Exclusion
CHLOROETHANE	SS	ND(11–14)	ND(11–14)	NA	0/41		
	LH	NA	1.2–2.0	1.6	2/6	No	Less than PRG for leachate (28,200 ug/L).
	SD	ND(31)	ND(12–65)	NA	0/11		Not detected in other media.
	SW	ND(5.0)	ND(5.0–10)	NA	0/9		
	GW	NA	ND(5.0)	NA	0/2		
CHLOROFORM	SS	ND(11–14)	ND(11–14)	NA	0/41		
	LH	NA	ND(5.0–10)	NA	0/6	No	Not detected in surface soil, leachate or sediment.
	SD	ND(31)	ND(12–65)	NA	0/11		Infrequent, isolated occurrence.
	SW	ND(5.0)	26	26	1/9		
	GW	NA	ND(5.0)	NA	0/2		
CHLOROMETHANE	SS	ND(11–14)	ND(11–14)	NA	0/41		
	LH	NA	1.0	1.0	1/6	No	Isolated occurrence equal to PRG for leachate (1 ug/L).
	SD	ND(31)	ND(12–65)	NA	0/11		Not detected in other media.
	SW	ND(5.0)	ND(5.0–10)	NA	0/9		
	GW	NA	ND(5.0)	NA	0/2		
CHRYSENE	SS	ND(380–460)	93	93	1/41		
	LH	NA	ND(10)	NA	0/6	No	Less than PRG for surface soil (8,770 ug/kg).
	SD	ND(1600)	45	45	1/11		Less than ER–L in sediment.
	SW	ND(10)	ND(10)	NA	0/9		Infrequent, isolated occurrence.
	GW	NA	ND(10)	NA	0/2		
1,2–DICHLOROETHANE	SS	ND(11–14)	ND(11–14)	NA	0/41		
	LH	NA	0.70	0.70	1/6	No	Less than MCL (5) in leachate.
	SD	ND(31)	ND(12–65)	NA	0/11		Not detected in other media.
	SW	ND(5.0)	ND(5.0–10)	NA	0/9		
	GW	NA	ND(5.0)	NA	0/2		
cis–1,2–DICHLOROETHENE	SS	ND(11–14)	ND(11–14)	NA	0/41		
	LH	NA	0.78–0.85	0.82	2/6	No	Less than MCL (70) in leachate.
	SD	ND(31)	ND(12–65)	NA	0/11		Not detected in other media.
	SW	ND(5.0)	ND(5.0–10)	NA	0/9		
	GW	NA	ND(5.0)	NA	0/2		
DIELDRIN	SS	ND(3.7–4.7)	1.7	1.7	1/41		
	LH	NA	ND(0.10–0.15)	NA	0/6	No	Less than PRG for surface soil (40 ug/kg).
	SD	ND(16)	2.6	2.6	1/11		Not detected in leachate or surface water.
	SW	ND(.10)	ND(.10)	NA	0/9		Infrequent, isolated occurrence.
	GW	NA	ND(0.11)	NA	0/2		

TABLE 1 (continued)

Occurrence and Distribution of Contaminants
Red Penn Site
Pewee Valley, Kentucky

Parameter	Media(1)	Control(2)	Range of Detects(3)	Average(4)	Frequency(5)	COC	Rationale for Inclusion or Exclusion
CHROMIUM *	SS	7 – 21	4.4 – 56	16	41/41		
	LH	NA	35 – 65	53	3/6	Yes	Exceeds state drinking water quality standard (50) in leachate.
	SD	91	5.5 – 110	43	11/11		
	SW	ND(10)	11 – 31	16	5/9		
	GW	NA	18	18	1/2		
COBALT	SS	4.8 – 16	2.2 – 19	8.9	41/41		
	LH	NA	55	55	1/6	No	Less than 2 x background in all media.
	SD	91	3.1 – 91	57	7/11		No EPA toxicity values available.
	SW	ND(10)	ND(4–30)	NA	0/9		
	GW	NA	ND(10)	NA	0/2		
COPPER	SS	4.3 – 16	2 – 31	8.9	31/41		
	LH	NA	ND(10–30)	NA	0/6	No	Less than 2 x background in all media.
	SD	33	2.8 – 33	16.7	6/11		Less than PRGs for surface soil (10,200 mg/kg) and leachate,
	SW	13	11	11	1/9		(1,350 ug/L)
	GW	NA	ND(10)	NA	0/2		
IRON	SS	10000 – 25000	8600 – 54000	22,300	41/41		
	LH	NA	1400 – 9000	13200	6/6	No	Mean concentration less than 2 x background in all media.
	SD	200000	6000 – 210000	109000	11/11		No EPA toxicity values available.
	SW	3800	1050 – 6900	2700	6/9		
	GW	NA	440–5200	2820	2/2		
LEAD *	SS	18 – 25	1.1–100	19.6	41/41		
	LH	NA	5 – 9	7	2/6	Yes	Exceeds 2 x background in surface soil.
	SD	78	4.6 – 98	39	11/11		
	SW	ND(40)	5	5	1/9		
	GW	NA	ND(40)	NA	0/2		
MAGNESIUM	SS	1000 – 58000	1300 – 61000	32,500	41/41		
	LH	NA	56000 – 190000	109000	6/6	No	Mean concentration less than 2 x background in all media.
	SD	3600	3100 – 63000	20000	11/11		No EPA toxicity values available.
	SW	15000	15000 – 74000	29000	9/9		
	GW	NA	43000–48000	45500	2/2		
MANGANESE	SS	560 – 2100	260 – 2900	1,100	41/41		
	LH	NA	340 – 825	550	6/6	No	Mean concentration less than 2 x background in all media.
	SD	10000	380 – 7100	3200	11/11		Less than PRGs in surface soil (27,400 mg/kg) and leachate,
	SW	120	21 – 320	112	9/9		(3,650 ug/L)
	GW	NA	21–160	91	2/2		

TABLE 1 (continued)

Occurrence and Distribution of Contaminants
Red Penn Site
Pewee Valley, Kentucky

Parameter	Media(1)	Control(2)	Range of Detects(3)	Average(4)	Frequency(5)	COC	Rationale for Inclusion or Exclusion
MERCURY	SS	ND(0.11–0.15)	0.12 –0.23	0.17	3/41		
	LH	NA	ND(0.2–0.3)	NA	0/6	No	Not detected above background in sediment.
	SD	0.06	0.05	0.05	4/11		Less than PRG in surface soil (82.3 mg/kg)
	SW	ND(0.2)	ND(0.2)	NA	0/9		Not detected in other media.
	GW	NA	ND(0.2)	NA	0/2		
MOLYBDENUM	SS	NA	NA	NA	NA		
	LH	NA	ND(10)	NA	0/3	No	Not analyzed for in surface soil or leachate.
	SD	ND(10)	ND(10)	NA	0/4		No evidence to link to the site.
	SW	ND(10)	11–20	16	4/4		
	GW	NA	ND(10)	NA	0/2		
NICKEL	SS	5.2 – 16	3.4 – 36	12	41/41		
	LH	NA	34 – 81	54	3/6	No	Less than MCL (100) in leachate.
	SD	73	3.1 – 75	37	11/11		Less than PRGs in surface soil (5,490 mg/kg) and leachate,
	SW	ND(20)	17 – 46	32	2/9		(730 ug/L)
	GW	NA	ND(20)	NA	0/2		
POTASSIUM	SS	480 – 1800	780 – 3800	2100	41/41		
	LH	NA	17000 – 580000	260000	6/6	No	Mean concentration less than 2 x background in all media.
	SD	ND(2000)	450–2200	1200	7/11		No EPA toxicity values available.
	SW	5800	5800 – 230000	34000	9/9		
	GW	NA	3800–6100	4950	2/2		
SILVER	SS	ND(0.72–1.9)	18	18	1/41		
	LH	NA	ND(2–10)	NA	0/6	No	Less than PRG in surface soil (823 mg/kg).
	SD	ND(10)	9.6	9.6	1/11		Not detected in leachate or surface water.
	SW	ND(10)	ND(3–10)	NA	0/9		Infrequent, isolated occurrence.
	GW	NA	ND(10)	NA	0/2		
SODIUM	SS	ND(50–210)	93 – 700	177	24/41		
	LH	NA	68000 – 1000000	440000	6/6	No	No EPA toxicity values available.
	SD	ND(1000)	220–860	350	7/11		
	SW	28000	28000 – 400000	93000	9/9		
	GW	NA	12000–25000	18500	2/2		
STRONTIUM	SS	NA	NA	NA	NA		
	LH	NA	160 – 560	290	3/3	No	Less than 2 x background in surface water and sediment.
	SD	90	76 – 120	90	4/4		No EPA toxicity values available.
	SW	72	75 – 83	80	4/4		
	GW	NA	460–1000	730	2/2		

TABLE 1 (continued)

Occurrence and Distribution of Contaminants
Red Penn Site
Pewee Valley, Kentucky

Parameter	Media(1)	Control(2)	Range of Detects(3)	Average(4)	Frequency(5)	COC	Rationale for Inclusion or Exclusion
TIN	SS	NA	NA	NA	NA		
	LH	NA	NA(25)	NA	0/6	No	Not detected in site leachate, sediment or surface water.
	SD	160	ND(25)	NA	0/4		Not analyzed for in surface soil.
	SW	ND(25)	ND(25)	NA	0/4		
	GW	NA	ND(25)	NA	0/2		
TITANIUM	SS	NA	NA	NA	NA		
	LH	NA	13 – 14	14	2/3	No	Less than 2 x background in surface water and sediment.
	SD	85	95–130	110	4/4		No EPA toxicity values available.
	SW	45	19 – 44	31	4/4		
	GW	NA	10–39	25	2/2		
VANADIUM	SS	13 – 37	9.1 – 82	27	41/41		
	LH	NA	ND(10–100)	NA	0/6	No	Less than 2 x background in sediment.
	SD	120	12 – 140	75	9/11		Less than PRG for surface soil (1,920 mg/kg).
	SW	ND(10)	ND(6–20)	NA	0/9		Not detected in leachate or surface water.
	GW	NA	ND(10)	NA	0/2		
YTTRIUM	SS	NA	NA	NA	NA		
	LH	NA	ND(10)	NA	0/3	No	Less than 2 x background in sediment.
	SD	45	46–62	52	4/4		Not detected in other media.
	SW	ND(10)	ND(10)	NA	0/4		
	GW	NA	ND(10)	NA	0/2		
ZINC	SS	24 – 54	11 –170	29	30/41		
	LH	NA	14 – 120	69	4/6	No	Less than 2 x background in sediment.
	SD	73	24 – 100	64	9/11		Less than PRG for surface soil (54,900 mg/kg).
	SW	14	16 – 88	52	2/9		Less than SMCL (5,000) in leachate.
	GW	NA	28–36	32	2/2		
CYANIDE *	SS	ND(0.59–0.80)	0.54 – 2.8	1.5	15/41		
	LH	NA	51 – 69	60	2/6	Yes	Exceeds 2 x background in surface soil and surface water.
	SD	ND(0.24)	ND(0.24–1.0)	NA	0/11		
	SW	ND(4)	350	350	1/9		
	GW	NA	ND(4)	NA	0/2		
4,4'DDE (P,P'–DDE)	SS	3.9 – 36	2.3–14	8.2	2/41		
	LH	NA	ND(0.10–0.25)	NA	0/6	No	Less than PRG for surface soil (1,880 ug/kg).
	SD	ND(16)	ND(3.9–16)	NA	0/11		Not detected in other media.
	SW	ND(0.10)	ND(0.10)	NA	0/9		
	GW	NA	ND(0.10)	NA	0/2		

TABLE 1 (continued)

Occurrence and Distribution of Contaminants
Red Penn Site
Pewee Valley, Kentucky

Parameter	Media(1)	Control(2)	Range of Detects(3)	Average(4)	Frequency(5)	COC	Rationale for Inclusion or Exclusion
BHC-GAMMA (LINDANE) *	SS	ND(1.9-2.4)	ND(1.9-2.4)	NA	0/41		
	LH	NA	0.94	0.94	1/6	Yes	Exceeds PRG for leachate (0.0655 ug/L).
	SD	ND(7.9)	ND(2.0-16)	NA	0/11		
	SW	ND(0.10)	0.028	0.028	1/9		
	GW	NA	ND(0.050-0.054)	NA	0/2		
BIS(2-ETHYLHEXYL)PHTHALATE *	SS	ND(380-460)	ND(380-460)	NA	0/41		
	LH	NA	ND(10)	NA	0/6	Yes	Exceeds MCL (6 ug/L) in monitoring well.
	SD	ND(1600)	ND(390-1600)	NA	0/11		
	SW	ND(10)	ND(10)	NA	0/9		
	GW	NA	46	46	1/2		
BROMODICHLOROMETHANE	SS	ND(11-14)	ND(11-14)	NA	0/41		
	LH	NA	ND(5.0-10)	NA	0/6	No	Not detected in surface soil, leachate or sediment.
	SD	ND(31)	ND(12-65)	NA	0/11		Infrequent, isolated occurrence.
	SW	ND(5.0)	5	5	1/9		
	GW	NA	ND(5.0)	NA	0/2		
CARBAZOLE	SS	ND(380-460)	ND(380-460)	NA	0/41		
	LH	NA	2	2	1/6	No	Less than PRG for leachate (4.26 ug/L).
	SD	ND(1600)	ND(390-1600)	NA	0/11		Not detected in other media.
	SW	ND(10)	ND(10)	NA	0/9		
	GW	NA	ND(10)	NA	0/2		
CARBON DISULFIDE *	SS	ND(11-14)	ND(11-14)	NA	0/41		
	LH	NA	1.8-17	9.4	2/6	Yes	Detected in both monitoring wells.
	SD	ND(77)	ND(12-160)	NA	0/11		
	SW	ND(12)	ND(10-12)	NA	0/9		
	GW	NA	20-42	31	2/2		
CHLORDANE ALPHA /2	SS	ND(1.9-2.4)	6.5	6.5	1/41		
	LH	NA	ND(0.05-0.62)	NA	0/6	No	Less than PRG for surface soil (493 ug/kg).
	SD	ND(98)	ND(2.0-100)	NA	0/11		Not detected in other media.
	SW	ND(0.62)	ND(0.05-0.62)	NA	0/9		
	GW	NA	ND(0.62)	NA	0/2		
CHLORDANE-GAMMA /2	SS	ND(1.9-2.4)	4.7-5.1	4.9	2/41		
	LH	NA	ND(0.05-0.62)	NA	0/6	No	Less than PRG for surface soil (493 ug/kg).
	SD	ND(98)	ND(2.0-100)	NA	0/11		Not detected in other media.
	SW	ND(0.62)	ND(0.05-0.62)	NA	0/9		
	GW	NA	ND(0.62)	NA	0/2		
CHLOROBENZENE	SS	ND(11-14)	ND(11-14)	NA	0/41		
	LH	NA	4.3-9.4	6.8	3/6	No	Less than MCL (100) in leachate.
	SD	ND(31)	ND(12-65)	NA	0/11		Not detected in other media.
	SW	ND(5.0)	ND(5.0-10)	NA	0/9		
	GW	NA	[illegible].0)	NA	0/2		

TABLE 1 (continued)

Occurrence and Distribution of Contaminants
Red Penn Site
Pewee Valley, Kentucky

Parameter	Media(1)	Control(2)	Range of Detects(3)	Average(4)	Frequency(5)	COC	Rationale for Inclusion or Exclusion
DIETHYL PHTHALATE	SS	ND(380-460)	41-46	44	3/41		
	LH	NA	ND(10)	NA	0/6	No	Less than PRG for surface soil (220,000 ug/kg).
	SD	ND(1600)	ND(390-1600)	NA	0/11		Not detected in other media.
	SW	ND(10)	ND(10)	NA	0/9		
	GW	NA	ND(10)	NA	0/2		
DI-N-BUTYLPHTHALATE	SS	ND(380-460)	ND(380-460)	NA	0/41		
	LH	NA	ND(10)	NA	0/6	No	Not detected in surface soil, leachate or surface water.
	SD	ND(1600)	120	120	1/11		Infrequent, isolated occurrence.
	SW	ND(10)	ND(10)	NA	0/9		
	GW	NA	ND(10)	NA	0/2		
ENDRIN	SS	ND(3.7-4.7)	0.72-2.2	1.5	2/41		
	LH	NA	ND(0.10-0.25)	NA	0/6	No	Less than PRG for surface soil (10,900 ug/kg).
	SD	ND(32)	ND(4.0-34)	NA	0/11		Not detected in other media.
	SW	ND(.25)	ND(.10-0.25)	NA	0/9		
	GW	NA	ND(0.20-0.21)	NA	0/2		
FLUORANTHENE	SS	ND(380-460)	67	67	1/41		
	LH	NA	ND(10)	NA	0/6	No	Less than PRG for surface soil (1460 ug/kg).
	SD	ND(1600)	92	92	1/11		Less than ER-L for sediment.
	SW	ND(10)	ND(10)	NA	0/9		Infrequent, isolated occurrence.
	GW	NA	ND(10)	NA	0/2		
METHYL BUTYL KETONE	SS	ND(11-14)	ND(11-14)	NA	0/41		
	LH	NA	2.2	2.2	1/6	No	Less than PRG for leachate (176 ug/L).
	SD	ND(77)	ND(12-160)	NA	0/11		Not detected in other media.
	SW	ND(12)	ND(10-12)	NA	0/9		
	GW	NA	ND(12)	NA	0/2		
METHYL ETHYL KETONE	SS	ND(11-14)	ND(11-14)	NA	0/41		
	LH	NA	ND(10-50)	NA	0/6	No	Not detected in surface soil, leachate or surface water.
	SD	ND(310)	59	59	1/11		Infrequent, isolated occurrence.
	SW	ND(50)	ND(10-50)	NA	0/9		
	GW	NA	ND(50)	NA	0/2		
NAPHTHALENE	SS	ND(380-460)	ND(380-460)	NA	0/41		
	LH	NA	1.5	1.5	1/6	No	Less than PRG for leachate (1460 ug/L).
	SD	ND(1600)	ND(390-1600)	NA	0/11		Not detected in other media.
	SW	ND(10)	ND(10)	NA	0/9		
	GW	NA	ND(10)	NA	0/2		

TABLE 1 (continued)

Occurrence and Distribution of Contaminants
Red Penn Site
Pewee Valley, Kentucky

Parameter	Media(1)	Control(2)	Range of Detects(3)	Average(4)	Frequency(5)	COC	Rationale for Inclusion or Exclusion
PCB-1254 (AROCLOR 1254)	SS	ND(37-47)	48-190	119	2/41		
	LH	NA	ND(1.0-2.5)	NA	0/6	No	Less than EPA remediation goal (1 ppm) for surface soil.
	SD	ND(190)	ND(40-200)	NA	0/11		Not detected in other media.
	SW	ND(1.2)	ND(1.0-1.2)	NA	0/9		
	GW	NA	ND(1.2)	NA	0/2		
PHENANTHRENE	SS	ND(380-460)	46-48	47	3/41		
	LH	NA	ND(10)	NA	0/6	No	Less than PRG for surface soil (8,230,000 ug/kg).
	SD	ND(1600)	65	65	1/11		Not detected in leachate or surface water.
	SW	ND(10)	ND(10)	NA	0/9		Less than ER-L in sediment.
	GW	NA	ND(10)	NA	0/2		
PYRENE	SS	ND(380-460)	59	59	1/41		
	LH	NA	ND(10)	NA	0/6	No	Less than PRG for surface soil (8,230,000 ug/kg).
	SD	ND(1600)	86	86	1/11		Not detected in leachate or surface water.
	SW	ND(10)	ND(10)	NA	0/9		Less than ER-L in sediment.
	GW	NA	ND(10)	NA	0/2		
TOLUENE	SS	ND(11-14)	2-4	3	3/41		
	LH	NA	0.58	0.58	1/6	No	Less than PRGs for surface soil (54,900 ug/kg) and leachate,
	SD	ND(31)	ND(12-65)	NA	0/11		(3,150 ug/L).
	SW	ND(5.0)	ND(5.0-10)	NA	0/9		Not detected in sediment or surface water.
	GW	NA	ND(5.0)	NA	0/2		
XYLENE-O	SS	ND(11-14)	ND(11-14)	NA	0/41		
	LH	NA	0.57	0.57	1/6	No	Less than PRG for leachate (828 ug/L).
	SD	ND(31)	ND(12-65)	NA	0/11		Less than MCL (10,000) in leachate.
	SW	ND(5.0)	ND(5.0-10)	NA	0/9		Not detected in other media.
	GW	NA	ND(5.0)	NA	0/2		
XYLENE (M-AND/OR P-)	SS	ND(11-14)	ND(11-14)	NA	0/41		
	LH	NA	0.52-1.5	1.1	3/6	No	Less than PRG for leachate (828 ug/L).
	SD	ND(31)	ND(12-65)	NA	0/11		Less than MCL (10,000) in leachate.
	SW	ND(5.0)	ND(5.0-10)	NA	0/9		Infrequent, isolated occurrence.
	GW	NA	ND(5.0)	NA	0/2		
XYLENES (TOTAL)	SS	ND(11-14)	ND(11-14)	NA	0/41		
	LH	NA	1-2	1.5	1/6	No	Less than PRG for leachate (828 ug/L).
	SD	ND(31)	47	47	2/11		Less than MCL (10,000) in leachate.
	SW	ND(5.0)	ND(5.0-10)	NA	0/9		Infrequent, isolated occurrence.
	GW	NA	ND(5.0)	NA	0/2		

TABLE 1 (continued)

Occurrence and Distribution of Contaminants
Red Penn Site
Pewee Valley, Kentucky

Notes:

1. SS is surface soil. LH is leachate. SD is sediment. SW is surface water. GW is groundwater.

2. Control samples are: surface soil– samples: SS–01, SS–04, SS–05, SS–06, SS–07, SS–08, SS–29, SS–30.
   Leachate– not applicable. Sediment–SD–06. Surface water– SW–06. Groundwater – none.

3. Surface soil samples were collected in October 1991. Leachate samples were collected in August and October 1991.
   Sediment samples were collected in September, October, and November 1991. Surface water samples were collected in September and October 1991.
   Units are: ug/kg for organic soil samples, ug/l for organic water samples (including leachate), mg/kg for inorganic soil samples, and ug/l for inorganic water samples (including leachate).

4. Arithmetic mean of samples with detected contamination "hits". Surface soil samples SS–02 and SS–03 not included. in these calculations as they appear to be unrepresentative of site conditions.

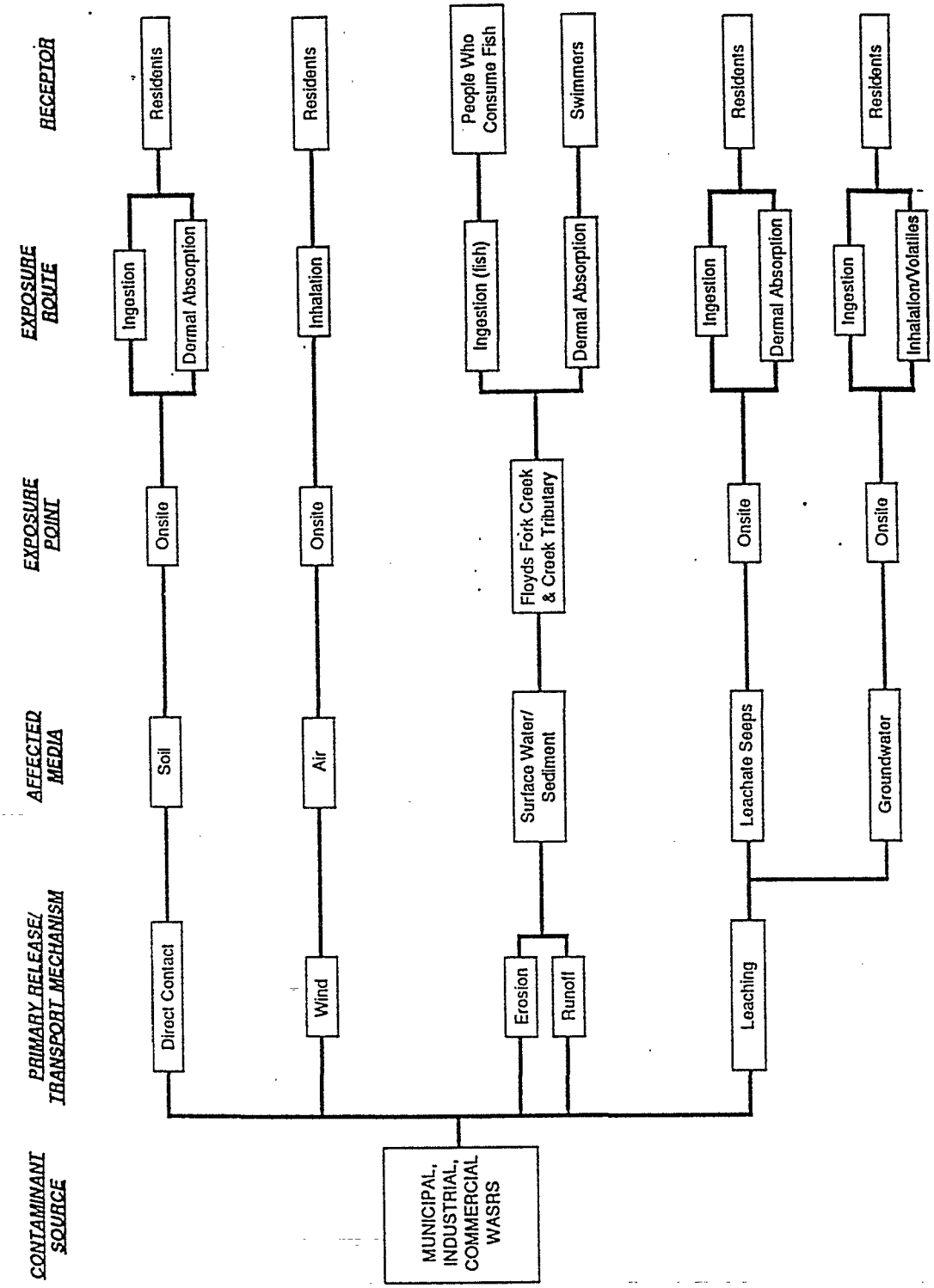
5. Detected contamination "hits" per sample location. Duplicate samples were combined, using the higher detected value.

   COC Contaminant of Concern

   ND( ) Not detected. The number (or range) is the sample quantitation limit (or range of SQLs).

   NA Not applicable.

   * Contaminant of Concern



CDM FEDERAL ARCS IV

CONCEPTUAL SITE MODEL

RED PENN SITE

PEWEE VALLEY, KENTUCKY

FIGURE NO.

10

TABLE 2

Cancer Slope Factors, Tumor Sites and EPA Cancer Classifications for Contaminants of Concern
Red Penn Site
Pewee Valley, Kentucky

COC	CSF(mg/kg/day)−1			Tumor Sites		EPA Classification
	Oral	Inhalation	Dermal (1)	Oral/Dermal	Inhalation	
CADMIUM	NA	6.3E+00 (2)	NA	NA	respiratory tract	B1
CHROMIUM VI	NA	4.2E+00 (2)	NA	NA	lung	A
LEAD	NA	NA	NA	NA	NA	B2
CYANIDE	NA	NA	NA	NA	NA	D
BENZENE	2.9E−02 (2)	2.9E−02 (2)	3.6E−02	hematological changes	hematological changes	A
ALPHA−BHC	6.3E+00 (2)	6.3E+00 (2)	1.3E+01	liver	liver	B2
BETA−BHC	1.8E+00 (2)	1.8E+00 (2)	3.6E+00	liver	NA	C
GAMMA−BHC (LINDANE)	1.3E+00 (3)	NA	2.6E+00	liver	NA	B2
BIS(2−ETHYLHEXYL)PHTHALATE	1.4E−02 (2)	NA	2.8E−02	liver	NA	B2
CARBON DISULFIDE	NA	NA	NA	NA	NA	D

(1) Derived from administered dose (oral) using a conversion factor of 80% for benzene, 50% for BHC isomers (Region IV guidance, March 23, 1993)
(2) IRIS, 1992
(3) HEAST, 1992

COC Contaminant of Concern
CSF Cancer Slope Factor
NA Not Applicable
EPA Classifications:
A Human Carcinogen
B1 Probable Human Carcinogen
B2 Probable Human Carcinogen
C Possible Human Carcinogen
D Not Classifiable as to Human Carcinogenicity

TABLE 3

Reference Doses, Target Sites, and Confidence Levels for Contaminants of Concern
Red Penn Site
Pewee Valley, Kentucky

COC	RfD (mg/kg/day)			Target Sites		Uncertainty Factor		
	Oral	Inhalation	Dermal (1)	Oral/Dermal	Inhalation	Oral	Inhalation	Dermal
CADMIUM	5.0E−04 (2)	NA	1.0E−04	kidney	NA	10	NA	High
CHROMIUM VI	5.0E−03 (2)	NA	1.0E−03	not defined	nasal mucosa atrophy	500	NA	High
LEAD	NA	NA	NA	CNS, hematological changes	NA	NA	NA	NA
CYANIDE	2.0E−02 (2)	NA	4.0E−03	weight loss, thyroid effects,	NA	100	NA	High
BENZENE	NA	NA	NA	NA	NA	NA	NA	NA
ALPHA−BHC	NA	NA	NA	NA	NA	NA	NA	NA
BETA−BHC	NA	NA	NA	NA	NA	NA	NA	NA
GAMMA−BHC (LINDANE)	3.0E−04 (2)	NA	1.5E−04	liver, kidney	NA	1000	NA	High
BIS(2−ETHYLHEXYL)PHTHALATE	2.0E−02 (2)	NA	1.0E−02	liver	NA	1000	NA	High
CARBON DISULFIDE	1.0E−01 (2)	2.9E−03	8.0E−02	fetal toxicity	fetal toxicity	100	1000	High

(1) Derived from administered dose (oral) using a conversion factor of 20% for inorganics and 50% for semivolatiles, and 80% for volatiles (EPA guidance, March 23,1993)
(2) IRIS, 1992

COC Contaminant of Concern
RfD Reference Dose
NA Not Applicable

risks were calculated. The process considered pertinent exposure pathways and routes in addition to other factors such as body weight and age of the person at risk, exposure to a single COC, simultaneous exposures to several COCS, and duration of exposure. Results of the calculations are summarized in Table 4. A review of the table indicates that estimates of cancer risk are as follows:

	Child Resident	Adult Resident
Exposure to Leachate	1.3E-6	2.2E-6
Exposure to Soil	1.6E-9	1.7E-9
Exposure to Groundwater	3.5E-6	6.0E-6

By summing the risks for a child and an adult across all pathways, the total cancer risk of 1.3E-5 is obtained for the site. This level of cancer risk is within EPA's acceptable range of 1.0E-4 to 1.0E-6. Therefore, no contaminants of concern were identified for the site.

As Table 4 indicates, a total Hazard Index of 0.98 was obtained for the site by summing the indices for a child and an adult over all exposure routes. The total HI is close to the EPA's threshold of 1.0 for unacceptable non-cancer risks. Never-the-less, adverse health effects are not expected for either a child or an adult resident since the residential scenario and/or consumption of leachate assumed in the calculations exaggerated actual exposure conditions. In addition, summing of the hazard indices assumed that toxic effects from the various exposure pathways would impact the same target organ. Most likely, however, the organ potentially affected by the COCS would vary with respect to exposure pathways. As presented in Table 5, HI ranges from approximately 0.1 to 0.5 for the different target organs and does not signify an unacceptable non-cancer risk.

6.3 Summary of Ecological Risk Assessment

A site reconnaissance was conducted to assess ecological risks associated with the landfill in 1991. The aim was to identify dominant species of fauna, flora, ecological receptors, and stressed environments in the area. In addition, the survey researched the endangered species and their habitats

TABLE 4

Summary of Site Risk
Red Penn Site
Pewee Valley, Kentucky

	Child Resident		Adult Resident		Child and Adult Resident	
Exposure to Soil	Cancer	HI	Cancer	HI	Cancer	HI
Oral	NA	0.06	NA	0.01	NA	0.07
Inhalation (dust)	1.6E−09	NA	1.7E−09	NA	3.3E−09	NA
Dermal Contact	NA	0.01	NA	0.003	NA	0.01
Total Source−Specific Risk	1.6E−09	0.07	1.7E−09	0.01	3.3E−09	0.08
Exposure to Leachate	Cancer	HI	Cancer	HI	Cancer	HI
Oral	2.4E−07	0.18	2.1E−07	0.04	4.5E−07	0.2
Dermal Contact	1.1E−06	0.03	2.0E−06	0.012	3.1E−06	0.04
Total Source−Specific Risk	1.3E−06	0.21	2.2E−06	0.05	3.5E−06	0.26
Exposure to Groundwater	Cancer	HI	Cancer	HI	Cancer	HI
Oral	3.5E−06	0.4	6.0E−06	0.2	9.5E−06	0.60
Inhalation (VOCs)	NA	0.03	NA	0.01	NA	0.04
Total Source−Specific Risk	3.5E−06	0.43	6.0E−06	0.21	9.5E−06	0.64
Total Site Risk	4.8E−06	0.7	8.2E−06	0.3	1.3E−05	0.98 *

HI Hazard Index (noncancer risk)
NA Not Applicable

* See Table 6−39−A

TABLE 5

Breakdown of Total Site Hazard Index by Target Organ
Red Penn Site
Pewee Valley, Kentucky

Exposure Route	Hazard Quotient at Target Organ					Total Source–Specific Hazard Index
	Kidney	Not Defined	Liver	Weight Loss, Thyroid	Fetal Toxicity	
Exposure to Soil						
Oral – Child	0.01	0.05	–	0.0005	–	0.06
Oral – Adult	0.001	0.005	–	0.00006	–	0.01
Inhalation of Dust – Child	–	–	–	–	–	–
Inhalation of Dust – Adult	–	–	–	–	–	–
Dermal Contact – Child	0.001	0.01	–	0.0001	–	0.01
Dermal Contact – Adult	0.0006	0.002	–	0.00002	–	0.003
Exposure to Leachate						
Oral – Child	0.08	0.04	0.001	0.06	0.0005	0.2
Oral – Adult	0.02	0.01	0.0002	0.01	0.0001	0.04
Dermal – Child	0.01	0.01	0.004	0.01	0.001	0.04
Dermal – Adult	0.006	0.002	0.002	0.003	0.001	0.01
Exposure to Groundwater						
Oral – Child	–	0.2	0.2	–	0.03	0.4
Oral – Adult	–	0.1	0.1	–	0.01	0.2
Inhalation (VOCs) – Child	–	–	–	–	0.03	0.03
Inhalation (VOCs) – Adult	–	–	–	–	0.01	0.01
Total Site Hazard Index						0.98
Total Target Organ–Specific Hazard Index	0.1	0.5	0.3	0.1	0.08	

Target Site Notes:

Kidney Toxicity – Cadmium

Not Defined – Chromium VI

Liver Toxicity – Lindane, Bis(2–ethylhexyl)phthalate

Weight loss, thyroid effects – Cyanide

Fetal Toxicity – Carbon Disulfide

– Not applicable

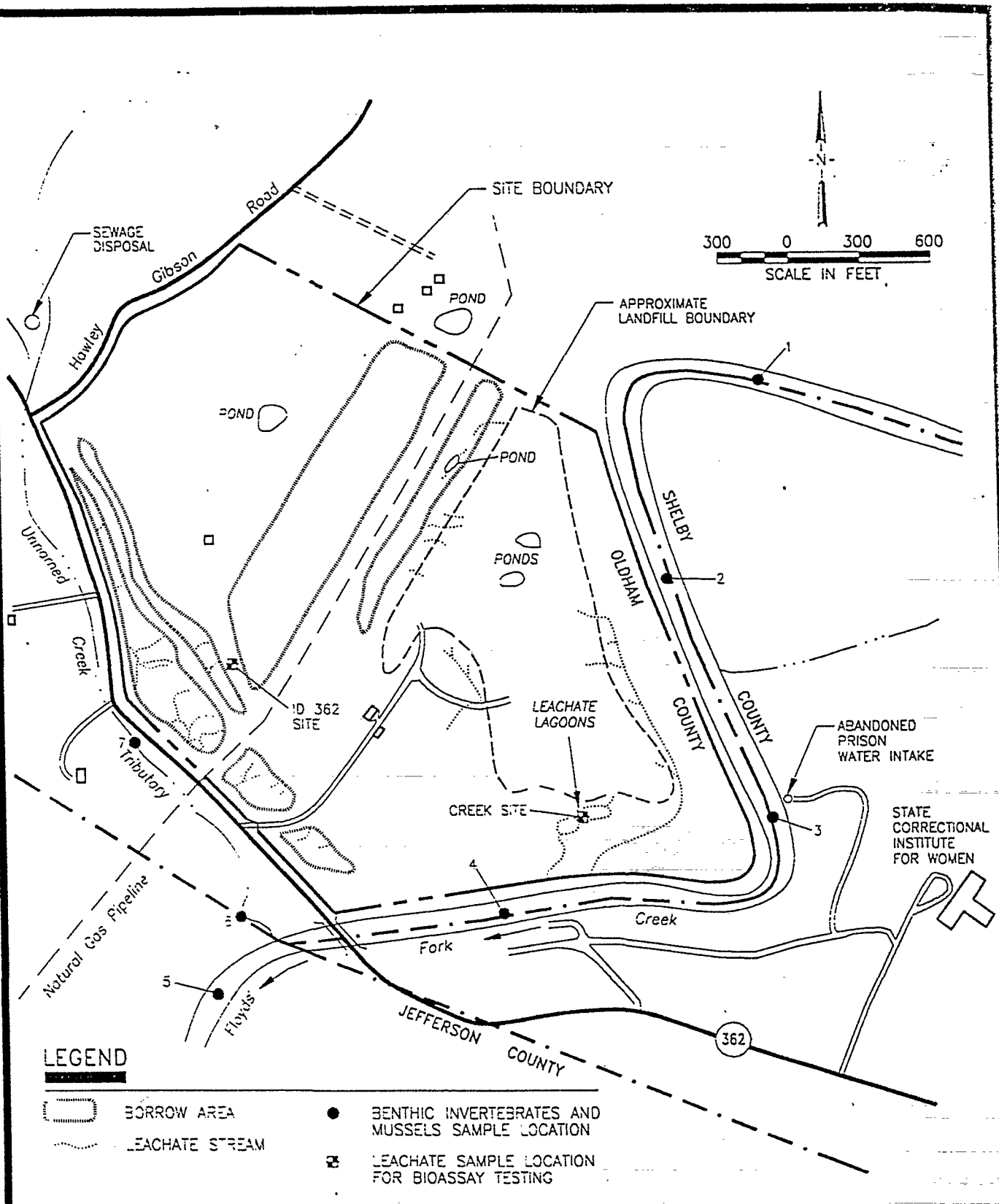
on and near the site. Stressed vegetation was observed in the vicinity of leachate seeps and their flow paths. No endangered or threatened flora or fauna was observed and no threat to their habitats was evident.

Ecological studies were conducted at the site to determine landfill impact on the structure and function of biological communities in the creek. The studies included collection and identification of benthic macro invertebrate, mussels sampling and metal analysis, and leachate toxicity testing on bioassay. Four locations on Floyds Fork Creek and two locations on the tributary were sampled for benthic macro invertebrates. The sampling locations are shown on Figure 11 where the background test location is labeled "1". Samples were processed in the laboratory where the organisms were identified to the lowest taxonomic level possible. Results of the species identification did not indicate a significant difference in diversity between the locations sampled. The diversity index calculated ranged from 2.42 to 2.98 which was considered normal for the area. However, at test locations #3 and #4, the study observed relatively high numbers of pollution tolerant species.

Fresh water mussels were collected by hand from stations 1 through 5 (Figure 11), on the Floyds Fork Creek. for tissue metal analysis. Table 6 presents the results and demonstrates that lead contamination was observed in the creek except in the up-gradient sample.

Toxicity analysis was conducted by obtaining leachate from two locations on the site. Two different aquatic communities (ceriodaphnia dubia and pimephales pomelos) were immersed in the leachate samples at various concentrations for ninety-six hours. Test results are presented in Table 7. The study showed that the populations of both test organisms were reduced considerably even at low leachate concentrations.

A fish study of the area conducted by the Commonwealth of Kentucky was reviewed during the RI. The study reported that Floyds Fork Creek supported a good amount of sport fishing. The report identified as many as eighteen species of fish at various stages of life and classified the population as 50% fingerlings, 46% of intermediate size, and the remaining 4% as harvestable size population.



ARCS IV

ECOLOGICAL SAMPLING LOCATIONS

RED PENN SITE

PEWEE VALLEY, KENTUCKY

FIGURE NO. 11

TABLE 6

RESULTS OF TISSUE ANALYSIS OF FRESHWATER MUSSELS FROM FLOYDS FORK OLDHAM COUNTY, KENTUCKY 8-17-91

Station	Species	Age (Yrs.)	Parameter (mg/Kg)				
			Cd[1]	Cr[2]	Pb[3]	Hg[4]	Se[5]
1A	*Lampsilis siliquoidea* *Anodonta grandis*	9 5	<0.5*	<1.0*	<0.5*	<0.05*	<0.5*
1B	*L. siliquoidea* *A. grandis*	7 5	<0.5*	<1.0*	<0.5*	<0.05*	<0.5*
2A	*L. siliquoidea* *A. grandis*	10 5	<0.5*	<1.0*	0.7	<0.05*	<0.5*
2B	*L. siliquoidea* *L. siliquoidea*	7 5	<0.5*	<1.0*	1.4	<0.05*	<0.5*
3A	*L. siliquoidea* *L. siliquoidea*	7 7	<0.5*	<1.0*	0.9	0.40	<0.5*
3B	*L. siliquoidea* *A. grandis*	7 5	<0.5*	<1.0*	0.8	<0.05*	<0.5*
4A	*A. grandis* *A. grandis*	4 3	<0.5*	<1.0*	1.1	<0.05*	<0.5*
4B	*L. siliquoidea* *A. grandis*	5 4	<0.5*	<1.0*	35.0	<0.05*	<0.5*
5A	*L. siliquoidea* *L. siliquoidea*	5 5	<0.5*	<1.0*	11.6	<0.05*	<0.5*
5B	*A. grandis* *Potamilus alata*	5 5	<0.5*	<1.0*	9.4	<0.05*	<0.5*

1. Cadmium - EPA method 200.7/9.3
2. Chromium - EPA method 200.7/9.3
3. Lead - EPA method 200.7/239.2
4. Mercury - EPA method 245.5
5. Selenium - EPA method 270.2/4.1.3

* Detection limit

Note: A and B represent replicates at the same collection station

TABLE 7

TOXICITY TEST RESULTS OF
SAMPLES COLLECTED ON AUGUST 7, 1991
RED PENN LANDFILL SITE, PEWEE VALLEY, KENTUCKY

Acute, 96-Hour, Static, Screening Test

Test Organism	Sample Description	Sample ID/Concentration (%)	Survival (%)
Ceriodaphnia dubia	Control	---	90
	ID 362	6.25	65
		12.5	50
		25	45
		50	60
		100	15

FINDING: LC_{50} = 20% Effluent Concentration

Test Organism	Sample Description	Sample ID/Concentration (%)	Survival (%)
Pimephales promelas	Control	---	95
	ID 362	6.25	100
		12.5	100
		25	100
		50	100
		100	15

FINDING: LC_{50} = 78% Effluent Concentration

TABLE 7 (continued)

TOXICITY TEST RESULTS OF
SAMPLES COLLECTED ON AUGUST 7, 1991
RED PENN LANDFILL SITE, PEWEE VALLEY, KENTUCKY

Acute, 96-Hour, Static, Screening Test

Test Organism	Sample Description	Sample ID/Concentration (%)	Survival (%)
Ceriodaphnia dubia	Control	---	90
	Creek Site	6.25	100
		12.5	0
		25	0
		50	0
		100	0

FINDING: LC_{50} = 9% Effluent Concentration

Test Organism	Sample Description	Sample ID/Concentration (%)	Survival (%)
Pimephales promelas	Control	---	95
	Creek Site	6.25	90
		12.5	0
		25	0
		50	0
		100	0

FINDING: LC_{50} = 8% Effluent Concentration

Independent fish tissue studies conducted by KDWM and the Agency for Toxic Substances and Disease Registry relative to the site were also reviewed. KDWM concluded that there were no clear indications of adverse site impact on their environmental specimens. Similarly, ATSDR concluded that consumption of fish from the creeks near the site should not result in adverse health conditions.

The most significant adverse ecological impact observed at this site is related to the leachate which apparently limited plant growth, and killed test aquatic micro-organisms upon direct contact. However, leachate outbreaks are localized and the flow can be restricted to the site. As stated before, a study of flora and fauna during the RI concluded that there were no endangered species or habitats in the area. Therefore, no major ecological risks appear to be associated with the landfill.

7.0 SCOPE AND ROLE OF RESPONSE ACTION

Over sixty different contaminants were identified during the laboratory analyses of field data from this site. Only ten of them were considered as COPCs. Human health and environmental risks associated with the COPCs were evaluated and found to be within acceptable levels based on EPA criteria. The current and future populations in the area are not expected to be affected adversely as a result of exposure to site contaminants. Therefore, no Superfund remedial action is warranted at the site. These conclusions were arrived at in 1993, when the RI was completed. At that time, EPA proposed an additional year of groundwater monitoring to validate RI results relative to seasonal variations. The confirmatory sampling was accomplished by KDWM in 1997. The results were similar to those obtained during the RI. In addition, EPA advised KDWM that proper closure of the landfill was necessary to minimize leachate problems. To address landfill closure, KDWM began negotiations with the responsible parties in 1994. The negotiations were concluded in 1999, when the responsible parties agreed to close the landfill properly by installing an approved cap. EPA reviewed the closure plan and concluded that it would adequately address site issues if implemented as designed. Essentially, the work would include landfill regrading, geosynthetic clay liner installation, re-vegetation, and site monitoring. Currently, construction of the landfill cap is in progress. To protect the cap, EPA recommends to the Commonwealth of Kentucky that future use of the property which

contains the landfill be restricted. Activities which may compromise the integrity of the liner should be prohibited by formal institutional controls.

EPA will continue to review site information from the Commonwealth or any other entity to ensure that acceptable human health and environmental standards are maintained. EPA may initiate further Superfund work at this site if additional information and/or new data reveal an unacceptable level of risk without re-ranking.

8.0 RESPONSIVENESS SUMMARY

When the RI was completed in 1993, EPA published a Proposed Plan. The document summarized the findings of site studies and risk assessment, indicated that no Superfund remedial action was warranted at the site, and scheduled a public meeting for August 5, 1993. A group of local environmentalists, local officials, and KDWM disagreed with EPA's "no action" proposal. EPA canceled the public meeting and engaged in a series of dialogue with the stakeholders. During the meetings, EPA explained the rationales for the Proposed Plan and that the unlined landfill needed to be properly closed under Kentucky's authority. KDWM expressed concerns about EPA's risk assessment methodology in general. Local officials and the environmentalists wanted all landfill content removed and disposed of elsewhere. Color and odor of leachate from the site were of concern in addition to landfill aesthetics. On August 5, 1993, top level officials and staff from the Commonwealth of Kentucky and EPA Region 4 met at the site with personnel from the local news media. At the meeting, EPA re-iterated the RI findings and the Superfund process, recommended to the Commonwealth to work directly with the PRPs for resolution of site issues, and reiterated the need to close the landfill properly. The Commonwealth requested EPA to postpone this ROD pending the results of the confirmatory site sampling, and the negotiations with the PRPs to close the landfill properly. KDWM began the negotiations with the PRPs in March 1994, and an Agreed Order to conduct the landfill closure was signed in late 1999, by the parties.

In April 2000, EPA re-published its Proposed Plan for a no-action ROD and held a joint public meeting with KDWM on April 20, 2000. During the meeting, EPA indicated that the landfill closure would be conducted by the PRPs under KDWM supervision. KDWM personnel then explained the details of the planned landfill cap to the meeting attendees. No objections were raised to EPA's Proposed Plan. However, several questions were posed to KDWM and were addressed appropriately as reported in the meeting transcript, Appendix A.

There were no written or verbal comments to EPA from the public during the comment period of April 13 to May 12, 2000. In June, 2000, five letters were received from four local residents and one congressman (Honorable Ken Lucas). The letters essentially expressed concerns that capping would not adequately address site issues. The letters and EPA responses are included in Appendix B. In addition, two local newspaper editors contacted EPA by telephone for an explanation of capping as an appropriate solution to the issues at the site.

APPENDIX A

PROPOSED PLAN PUBLIC MEETING TRANSCRIPT

RED PENN LANDFILL SITE

PROPOSED PLAN PUBLIC MEETING

HELD ON APRIL 20, 2000

BARBARA J. CRAWFORD
Court Reporter
8503 Wyndstar Place
Louisville, Kentucky 40242-4520
(502) 339-8212

The Proposed Plan Public Meeting for the Red Penn Landfill Site, on Thursday, April 20, 2000, 7:00 p.m., at the Oldham County Community & Convention Center, 1551 North Highway 393, Buckner, Oldham County, Kentucky.

MS. BARRETT: We want to welcome you to the meeting tonight. My name is Diane Barrett. I do community relations for the EPA out of our Atlanta office. So, I'm here tonight to make sure that everybody has got information and can ask questions regarding community involvement.

The purpose tonight of course is to discuss the Red Penn Landfill and what actions are going to be taken at this site.

To start, I want to give you just a little bit of an overview of the Superfund process. I hope you all picked this up. I don't know how familiar you are with the Superfund process, but this is it in a nutshell, front and back.

As you see, there's the site discovery phase. And then, in 1989, the site, Red Penn Landfill, was placed on the National Priorities list, the Superfund National Priorities List, which made it eligible for EPA funding, in the event there was a responsible party that

was not able to pay for cleanup or bankrupt or deceased, or whatever. So, that fund is there for those kind of sites.

Then, in 1991 through 1993, EPA began their remedial investigation, and feasibility studies started after that.

And we are at this point now where we're at, our proposed plan public meeting. And tonight, Femi Akindele, who is the project manager, Mr. Akindele here, will provide you information about the site, a little bit of history in what the EPA is proposing. Then, Mr. Rick Hogan, for the State, will go over what the State's plans are.

This meeting is by law having to be recorded by a court reporter. So, when the court reporter is taking your words or our words as we talk, please make sure that you enunciate plainly.

And if at any time she doesn't understand you, I've asked her to just stop and ask you to repeat it. So, if you'll just give your name and your question so she can hear that, we would appreciate it.

And then, this transcript will be made available and placed in the information repository for this site so that you all can review that.

The record of decision, after the comment

period, which is a 30-day comment period -- the comment period runs from April the 13th to May the 12th. And if you desire additional time, we can grant that for you.

But once the comment period is closed, then the record of decision will be prepared. And this is our document that states what the EPA's action is, what their decision is.

Then, normally after that is done, there's a remedial design prepared. In this case, the design has already been prepared as a capping. And then, remedial action takes place.

So, that, in kind of a nutshell, when you read through this, that will give you what we're in the process of doing.

At this time, I will turn it over to Mr. Femi Akindele, and he will go on with the EPA. Thank you very much for your attention.

MR. AKINDELE: Well, good evening, ladies and gentlemen. I'm going to sit down, and, if it gets to a point where you can't understand me or you don't hear me, I'll get up and walk around or do whatever needs to be done.

Has everybody got a chance to read the fact sheet prepared by the EPA? There were two that came out recently, one from the State of Kentucky or Commonwealth

of Kentucky, and another one from the U.S. EPA out of Atlanta.

Is there anybody here that is not familiar with the site? Then, I am not going to waste your time going over the history and how we came to where we are.

There are only three points I'd like to make tonight and I'm going to turn it over to Rick after those three points are made. One is that EPA is responsible to find sites and clean them, if they require cleaning.

Particularly the Superfund group is responsible for finding and cleaning sites that are abandoned, like the Red Penn Landfill. We try to do those things, finding them and cleaning them, if cleaning is needed, by following some guidelines, and those guidelines are recorded in the fact sheet that Diane was talking about early on, the Superfund process.

In addition to following the guidelines, we do the best we can with science and engineering to study the sites and clean them, as best as we can, whenever cleaning is required. At times, cleaning will not be required, especially by the Superfund group, if the criteria that the law stipulates are not met.

With respect to the Red Penn Landfill, the U.S. EPA got involved about twelve years ago and came out here and evaluated the site, collected as much information as

we could, and evaluated the results of lab analysis.

We concluded after doing risk assessment that the site did not meet the criteria established for Superfund cleanup. But that does not mean that the site does not require some action.

Consequently we pointed it out to the State that the landfill needed to be capped. The landfill was never properly closed after the operation ceased.

With the fact that some PRP's were found viable and the fact that the State was also interested in making sure that the site protects human health and the environment, EPA stood along the side of the State while negotiations were being made with the PRP's to do the appropriate things with respect to capping the site.

I think it's been about three months or so, maybe a little more than that now, that the State was able to reach agreement with the PRP's, and plans are in place to completely take care of the problems at the Red Penn site.

Consequently, the EPA's plan, which was actually made after we did the studies about five years ago, to do nothing with Superfund money, is now going to be published. And that's why we published the proposed plan.

Because we did one back in 1993, I believe, and

it states exactly what I'm saying now, that we studied the site, we found some problems, some chemicals that are not acceptable or conducive to human health and the environment.

However, when we evaluated the risks associated with those chemicals, the criteria for cleanup with Superfund money were not met. Again, we felt like the site needed some action. Therefore, we asked the State to directly contact the PRP's and get them to do what is right.

At this point, like I said earlier on, the State has successfully negotiated a cleanup action for the site. Therefore, EPA is going to publish the record of decision to state the activities that we performed at the site and conclusions that we reached.

At this point, Rick will discuss what the plan of action is, and I'll take questions after his discussion.

MR. HOGAN: I'm Rick Hogan, with the State Division of Waste Management. And we met with many, if not all, of you in December to discuss the plan for this site.

And I realize that it's a little confusing that EPA is saying that they're not going to take any action, yet we are going to take action, but they have their procedures that they have to follow.

There are criteria which have to be met before they can take an action. Those criteria were not met; they could not take an action.

The State negotiated directly, beginning in about 1994, with the responsible parties. It has taken way too long for us reach agreement, but we have. We negotiated a design for the site. We approved the design for the site.

Construction activities will begin very shortly. We have a construction contractor, which has been selected. They're Kester Contracting out of Evansville, Indiana.

The oversight engineering contractor will be RMT, Incorporated, out of Madison, Wisconsin. They also have representatives here. And then also, of course, the State of Kentucky will be overseeing the activities.

They're set to begin shortly; they're going to be mobilizing in a couple of weeks, bringing in their equipment. There won't be a lot of traffic that you'll see; you may not see any traffic in the area, unless you're there at the right time, minimum of truck activity.

They'll be working there all Summer. They'll be grading the site, clearing a lot of trees over the next month or two, shaping the site. There won't be a lot of earth moved, just generally regrading a few areas to

prepare a proper bed for the geosynthetic material, which is going to cap the site. And that material will prevent rain water from coming in and infiltrating into the waste and leaching out into the environment, as it has been doing for the last 20 or 30 years.

This is something we should have done many years ago. I apologize that we have not taken action earlier; we haven't, but we're going to this Summer and hopefully eliminate this contamination which is emanating from the site.

That's really all about I have to say. I'll welcome any questions that you have about the specifics.

MR. AKINDELE: I just want to make one more comment before the questions come out. Because the site has been on the NPL, or the National Priorities List, meaning that it qualified for Superfund activities, means that EPA will continue to reveal information passed on to EPA, and EPA will come in any time that human health and the environment or human health or the environment is in jeopardy. So, let's keep that in mind.

The fact that EPA says the results of our evaluation show that there will be no action at this point does not mean that we abandoned the site forever. We'll come back and do what has to be done to make the site safe for human health and the environment, if additional

information indicates that we need to do anything different than what action we are taking now.

MR. DON DAVIS: I'm Don Davis. I live on Hawley Gibson Road. How big an area is condemned?

MR. HOGAN: About 50 acres. The actual active landfill site is about 50 acres. So, that will be the area which will be capped.

They will also be utilizing another 30 or 40 acres as a borrow area, which will be near to Hawley Gibson Road. So, you may see some activity over there. You probably won't see much going on at the actual landfill site, but you'll see activity in the borrow area.

MR. DAVIS: Well, there's another area at the north end of Francis Avenue that was -- that's not part of this, right?

MR. HOGAN: No. I'm not familiar with the property you're speaking of, but I know it's not part of this

MR. DAVIS: Well, it's about maybe a quarter of a mile away, and I understood that there was an area there that was part of this Red Penn.

MR. HOGAN: I'm familiar with the Puckett property

MR. DAVIS: No. It used to be the Marshall Auto Dump, or something.

MS. YATES: It's Griffith Auto Salvage.

MR. DAVIS: They had taken some of the material from

Red Penn to that area.

MR. HOGAN: Yeah, I'm sorry, I'm not at all familiar with that site.

MR. DAVIS: Will you look into that?

MR. HOGAN: Yes, sure. What's the name of it again?

MS. YATES: Griffith. It's at the very beginning of Richard Griffith's property.

MR. HOGAN: Griffin property?

MS. YATES: Griffith, I think. I-t-h, I believe.

MR. HOGAN: And where? On Francis?

MS. YATES: It's at the end of Francis Avenue.

MR. HOGAN: Francis Avenue.

MS. PAYNE: Doesn't Francis run into Hawley Gibson?

MS. YATES: Yes, it does.

MR. HOGAN: If you'll give me your name and phone number afterwards, I'll check on that and give you a call. Yes, sir?

MR. BILL WETTER: I'm Bill Wetter. I'm the Environmental Health Director for Jefferson County. Rick, I'm interested in continuing ground water monitoring at event sites after camping takes place. Any plans to continue that, and for how long?

MR. HOGAN: Yes, our agreement with the responsible parties requires that they conduct ground water monitoring for a minimum of five years. At the end of five years, we

will evaluate the results to determine whether additional monitoring beyond that time is necessary.

In addition, we are contracting with USGS to do a general ground water user study in the area, and that will be conducted possibly this Summer. And if we find wells or springs which we feel like may be connected to the site, we'll sample those areas also. These will be off-site areas, down-gradient of the landfill. Yes?

MR. MARK JACKIE: My name is Mark Jackie. I live on Ash Avenue. Is there a way for us to see what area within that 150 acres is going to be capped?

I live directly across the street, on a far hillside, and, you know, I look out and I see rocks. And I was under the impression that was something else when I moved in; I wasn't from around this area.

But my concerns are (1) in that area on Ash Avenue, when we have heavy rains, the road is completely flooded. To give you an idea, my mailbox at one point was two feet under water.

Now, that water runs across Ash Avenue, up my property some 20, 30 yards, all the way across to the bottom of that rock wall. I've walked that area, not very much, but I've seen something coming out of the ground in that area.

You know, my concerns are, when we have heavy

rains, there's a creek that runs parallel with Ash, I think it's called Flat Rock Creek, I'm not sure --

MR. HOGAN: We've called it Ash Creek, I think.

MR. JACKIE: Well, it runs into Floyds Fork --

MR. HOGAN: Yes.

MR. JACKIE: -- three or 400 yards down the road. I mean it's just a mess. It's flooded for 300 yards --

MR. HOGAN: I noticed the culverts to perhaps your next-door neighbor were blocked with debris today. There was evidence of some heavy flow.

MR. JACKIE: Oh, it's ridiculous, you know. A hundred-year flood plain, and I believe it.

MR. HOGAN: Well, I do have, in answer to your first question, some maps over here which will show you the areas which will be actively remediated. There will be an erosion control plan to prevent sediment runoff from the entire area.

As far as controlling the runoff of water, I'm afraid we're not going to be improving that, at least during the construction.

After construction is completed, runoff should be directed more toward Floyds Fork rather than across Ash Avenue. It perhaps would help some. But I'm not sure we're going to be able to help your flooding problem.

MR. JACKIE: Well, that's not what I'm asking. I mean

it's been doing that forever.

MR. HOGAN: Yeah.

MR. JACKIE: But it is a concern of mine that whatever is coming out is coming over.

MR. HOGAN: And there are springs which exit -- that you're probably referring to, that exit that rock cliff --

MR. JACKIE: Right.

MR. HOGAN: -- there are springs. And those are some of the springs we'll be monitoring, because there has been some contamination coming out that way. So, we may in fact dry those springs up; we hope to.

MR. DAVIS: Has any ground been moved in that area?

MR. HOGAN: No. No, there's been no activity there.

MR. DAVIS: It looked like there had been some work done years ago.

MR. HOGAN: Oh, yes. Oh, certainly, yes. When there's an active landfill --

MR. DAVIS: I mean since it closed.

MR. HOGAN: There was one small drum removal about '86, but not since that time.

MR. JACKIE: Nothing grows on that area that I'm speaking of.

MR. HOGAN: Right, nearest to Ash Avenue.

MR. JACKIE: Right. And that does concern me. There's nothing --

MR. HOGAN: Yeah, it's bedrock. And there's no plan to do anything with that area.

MR. JACKIE: Once the landfill is capped, how much, if any, maintenance will be required and who will be responsible for that maintenance.

MR. HOGAN: Well, that site will need to be maintained.

MR. JACKIE: In what way?

MR. HOGAN: Into the near future. We cannot allow trees to grow on that site. Trees will penetrate that cap and create conduits for the flow of water. So, we have to keep that site mowed.

And by we, I mean the responsible parties, Ford Motor Company waste management will have a contractor out there to mow the site and to repair any erosion, to repair anything that goes wrong for the foreseeable future.

MR. JACKIE: Will the residential waste and litter and trash be taken care of at the same time? The area I'm talking about is a slope that runs down basically towards Floyds Fork. It's a treed area. I understand at one point it was used for residential waste.

There are areas there that you can't stay on your feet, there's so much garbage in there. Will that be --

MR. HOGAN: I believe so, yes. I'll show you on the

map, and I think I know where you're talking about. Those areas will all be cleaned up.

A lot of trees will be removed. Some of those areas are so old, there are trees this big. And unfortunately we're going to have to remove a whole lot of trees, which I hate to do, but that's the only way to get a cap on those areas. Tim?

MR. TIM FEELEY: I'm Tim Feeley, from Crestwood. Two questions. First, since our last meeting, which I think was in December, has there been any further inquiry into where the barrels are? I remember we talked last time, and we know there are some out there but didn't know exactly where they were.

MR. HOGAN: No, no further work.

MR. FEELEY: I apologize, I came a little late, but did you give a timetable for when work will begin?

MR. HOGAN: Work will begin in the very near future. In the next couple of weeks, the contractor will be mobilizing, bringing their equipment onto the site. Shortly thereafter, they will begin the earth work, which will be the majority of the work.

The intent is to have the project finished by the end of the construction season, November, December. But, as I said before, I suspect they'll be back out there next Spring to tidy things up, correct some erosion

problems. So, I think you will see some people out there next Spring.

MR. JOHN KIELKOFF: Do you have a plan for what you're going to plant, what kind of grass, and so forth?

MR. HOGAN: The specification is what is called the DOT mixture. It's what the Department of Transportation approves for planting on the properties that they have.

And so, as the construction contractor or someone pointed out earlier today, if you'll drive down the road and look at the vegetation on the side of the road, that's basically what will be on the site.

Now, if you have suggestions, I'm certainly open to suggestions for plantings which could enhance the appearance or value of that property, I would certainly take that into consideration, and I would hope that the contractors, the responsible parties, would, too. Yes, sir?

MR. TERRY GAGEL: On the tree removal on the stream side, how far down would you be removing trees? Would you get down to the flood plain?

MR. HOGAN: No, I don't think so. We're going to get very close. They've submitted an application to construct within the flood plain, but they will just barely get into what is defined as the flood plain. The toe of the landfill will essentially be that break where the flood

plain sort of begins.

MR. GAGEL: And that will be the extent of the cap? It will come to that point?

MR. HOGAN: Yes. Yes. And you'll see rock riprap all around the base of that landfill. And that riprap itself will, I believe, sit slightly in the flood plain. It won't be right next to the stream, but it will be in that flat area which is defined as the flood plain.

MR. JOHN BLACK: I'm the County Judge/Executive here in Oldham County. What kind of bricks does the landfill -- what is opposing -- just as it sits there today and just in capping, the extent that you're going to do the cleanup, is that just because of the appropriation of what's allowable to go into that site, or if more could have been spent or appropriated, would it have been done in a different manner, you know, and to what degree further?

MR. HOGAN: Well, I believe, given the situation, we're doing what -- the best that technology has to offer, within reason. You could go in, remove all of the materials, at a tremendous expense, and I'm not sure, in the long run, you will have created a better environment overall.

You can imagine quite an effort would have to be made. You'd have tens and hundreds and thousands of

trucks hauling materials away along your roads. You would be digging into the materials, exposing waste materials, which would be difficult to contain.

It's just not something that's done. To my knowledge, it's never been done in the United States, where you dig up a landfill of this magnitude.

Given the situation, the best that you can do is simply put an impermeable cover on it. It's not a perfect solution. The site is going to be there a hundred years from now with contamination.

I don't really like the thought of passing something like this down to our children and grandchildren. But given the realities, that's about the best that we can do at this time.

Perhaps in the future, technologies will be discovered where we can inject microbes or chemicals or something into the landfill which will act to remediate it on its own. But presently, that technology is in its infancy.

MR. GAGEL: There are monitoring wells on the landfill now, is that correct?

MR. HOGAN: There's one monitoring well on the perimeter. There are three lysimeters, which simply monitor water level within the landfill itself, but only one monitoring well.

MR. GAGEL: The monitoring well, will you test that on an annual basis?

MR. HOGAN: That will be tested on a quarterly basis for two or three years and then a semi-annual basis for the next two or three years, at which time we will evaluate the data to determine future monitoring requirements.

MR. GAGEL: What has been the results of the data up to now?

MR. HOGAN: We found relatively low levels of various chemical compounds and heavy metals to date. Really the springs are a better indicator of what's coming off the site.

We monitor four -- or we will be monitoring four or five different springs, and they are really the best indicator of what's coming off the site.

But two of the main contaminants that I recall are PCB's and heavy metal lead were the ones that kind of stuck out in my mind.

MR. WAMPLER: Are there any plans for retention basins or retaining walls to help keep what water flow there might be out of Floyds Fork?

MR. HOGAN: Well, no, no retention basins. An erosion control plan has been submitted, and I understand perhaps it's been -- it is going to be approved for silt fences.

Silt fences will be the primary method of containing erosion. And it will be around, oh, about 75 percent of the site or more, a continuous fence to catch sediment particles.

But no sediment basins are proposed. That could change. If they're needed, I think they'll be constructed.

REPORTER: May I have your name, sir?

MR. WAMPLER: Roger Wampler. I'm solid waste coordinator for Oldham County.

MR. HOGAN: We have individuals here, as I mentioned, from the engineering oversight management team, RMT and from Kester Contracting. So, afterward, if you'd like to speak individually to them, I think they'd be glad to talk to you about specifics.

MR. BLACK: How much is this project going to cost to clean up?

MR. HOGAN: Somewhere on the order of Three or Four Million Dollars, I think. Any other questions?

MR. SHAWN TAPP: My name is Shawn Tapp. Is the State of Kentucky going to take over the control of the property or are they going to be kept owned by the Red Penn people, or whoever owns it?

MR. HOGAN: No, the State doesn't want the property, federal government doesn't want the property. It will

remain in the hands of the current owners, which I believe is Red Penn Sanitation Corporation.

MR. TAPP: Is the State planning on putting any kind of restrictions --

MR. HOGAN: There will be deed restrictions on the use of the property so that the cap is not in any way punctured or it remains intact. Yes, there will be deed restrictions.

MR. JACKIE: I think there's a Texas gas line that runs somewhere through that property, I think two pretty large transmission lines. Is that in any way affected? Was the contaminated area near those gas lines? And if so, what happens if they've got to go work on these transmission lines?

MR. HOGAN: Well, that issue was studied several years back, and it was concluded that those transmission lines in no way provide a conduit for the flow of contamination, nor would activities along that line affect the landfill itself.

MR. JACKIE: How far is that contaminated area from those gas lines, approximately?

MR. HOGAN: The map will give you the specifics, but it's 50 yards, a hundred yards, I think. There's also, as many of you may know, a road which is being planned to go through that area.

And I just happened to pick up a map showing that there are basically three alternatives for that road through the area. And many of you may already know all of this, but I got the map recently, and it's not an official map, but it will show the alignment of those three options.

None of those options will go through the landfill. One or two of the options will impinge upon the northern end of the property, along Hawley Gibson Road. Yes, ma'am?

MS. BARBARA YATES: I'm Barbara Yates. I'm the one that sent you the Commonwealth technology statement.

MR. HOGAN: Oh, okay.

MS. YATES: My question is in regards to the silt fencing and the road. Does the road alignment in any way look like it's going to impinge upon the silt fencing or borrow area --

MR. HOGAN: Well, the silt fence will be a temporary measure.

MS. YATES: It's temporary only?

MR. HOGAN: So, I think, by the time the road is constructed, it will be gone.

MS. YATES: Okay.

MR. ERNIE HARRIS: Is there going to need to be a gas collection system on this?

MR. HOGAN: No. We discussed that and evaluated it and decided we would not need that for a landfill of this age.

MS. BARRETT: Are there any other questions before we adjourn?

MR. BLACK: How many types of personnel or numbers will be working in there through the Summer?

MR. HOGAN: Somebody from Kester can answer that better than I.

MR. NIEHAUS: My name is Rick Niehaus. I'll be the project manager there. We anticipate an initial work force around 15 workers, doing the initial clearing and earth moving.

Once the liner installer comes on board, he will have a work force probably of another 12 to 15 workers. So, at a maximum, it will be a peak of 30. And then, once the liner is done, the final finishing, we'll be back down to 12 to 15 toward Fall.

MR. BLACK: Will you have to bring any dirt to the site or pretty much use what's there.

MR. NIEHAUS: The current plan is to use what's there from the borrow site adjacent to the landfill, depending on the geological conditions and the depth of the rock, the extent of that borrow area. Steps are being finalized.

MR. HOGAN: You'll see very little traffic. You may not even know these guys are there.

MR. JACKIE: I will.

MR. HOGAN: You will. I noticed a very fine home being constructed across Floyds Fork from the site. Mr. Jackie, are you familiar with that construction? Does that fellow know what's going to be going on?

MR. JACKIE: I don't know. He hasn't come and asked me.

MR. HOGAN: Roger?

MR. WAMPLER: With the test wells you're going to have, the analyses that you're going to be doing on the water in those wells and in those springs, are those going to be available for us to see?

MR. HOGAN: Yes, and that's a good point. And someone suggested at the last public meeting that we set up a website so that we can provide that information. And we do intend to post that information on our website as it becomes available.

That testing will not begin until after the construction is finished. So, that will be next year about this time that we'll begin sampling.

But I will develop information on our website. I think I gave that address; I hope that was the correct address. And the information -- there's no information

there now regarding Red Penn, but there will be.

MR. WAMPLER: While the process is going on, could Richard Benton and myself -- would we be allowed to observe from time to time?

MR. HOGAN: Absolutely, yes.

MR. WAMPLER: Okay, very good.

MR. HOGAN: Yeah, you could call me or I can give you a contact at the site if you want to call them.

MR. WAMPLER: Thank you, Rick.

MR. JACKIE: I'd like to have that.

MR. HOGAN: Sure. Sure. I'll give you my card. I have a card over there on the table. We intend to be over there, myself and Eric Liebenhauer, my associate. We intend to be over there every week or two or more, as conditions warrant.

In addition, RMT will have a person on site all of the time. So, we'll have plenty of oversight, I think.

MR. BLACK: Is the reason you actually cap a site like this so the rainwater won't go down through the surface and push the things outward, so they're pretty much contained and let them sit there as they are? Is that the purpose of that?

MR. HOGAN: Yes, that's it in a nutshell.

MR. JACKIE: This may be way out there, but it will be the last thing I ask you. Have there been any studies

done on any wildlife as far as toxin buildup in deer, small game, for that matter, cattle that water in that area? Have there been any tests done on that?

MR. HOGAN: We have not done any. I don't think, Femi, that EPA did any during its investigation either.

MR. AKINDELE: If I remember well, there was fish studied.

MR. HOGAN: Okay, yeah.

MR. JACKIE: And they showed no sign of --

MR. HOGAN: They did show some signs. In fact, again, I'm glad you brought that up, someone at the last meeting asked if we were going to continue to evaluate the stream, the microorganisms and the fish in the stream. And, yes, we will do that.

I talked to our experts in the Division of Water. They suggested that a study of that type would best be done perhaps a couple of years after the site is remediated because you wouldn't see the effects immediately in the organisms in the stream. But after a couple of years, we should begin to see the effect of eliminating the source of contamination.

MR. AKINDELE: There is a short paragraph here in the paper that shows the effects.

MR. BLACK: I want to thank you all for giving us the opportunity. It's only because we contacted you all to

have another session to see if there were any final questions, or anything, so I appreciate the State and the federal folks for coming in tonight to see if there were any further questions to be answered or asked.

MR. HOGAN: If you like, we can conduct another meeting, perhaps in the Fall, when construction is about over. We don't have one planned right now, but if there is interest, give me a call and we'll have another meeting at that time.

MR. DAVIS: Can we have one just for quality control, update on what you did do, maybe after it's finished?

MR. HOGAN: Sure.

MS. BARRETT: Any other questions? Thank you very much for coming. Your questions were great, and we appreciate it. We look forward to seeing you again. Thank you.

STATE OF KENTUCKY)
(SS:
COUNTY OF OLDHAM)

I, BARBARA J. CRAWFORD, a Notary Public within and for the State of Kentucky at Large, do hereby certify the foregoing transcript of the Proposed Plan Public Meeting on the Red Penn Landfill Site was transcribed by me in the presence of all who attended the meeting; that the foregoing is a full, true and correct transcript of the said Meeting.

WITNESS MY SIGNATURE THIS 1st day of May, 2000.

My commission expires the 5th day of April, 2002.

Barbara J. Crawford
BARBARA J. CRAWFORD
Notary Public,
State at Large, Kentucky.

APPENDIX B

CORRESPONDENCE ON LANDFILL CAPPING

4TH DISTRICT
KENTUCKY

COMMITTEES:
AGRICULTURE
BUDGET

5 9 0087

Congress of the United States
House of Representatives
Washington, DC 20515

OFFICES:
1237 LONGWORTH H.O.B.
WASHINGTON, DC 20515
(202) 225-3465

277 BUTTERMILK PIKE
FORT MITCHELL, KY 41017
(606) 426-0080

FEDERAL BLDG., SUITE 236
1405 GREENUP AVENUE
ASHLAND, KY 41101
(606) 324-9898

May 12, 2000

Ms. Diane Barrett
Environmental Protection Agency
Region IV
61 Forysth Ave., S.W.
Atlanta, GA 30303

Dear Diane:

I have been contacted by several of my constituents who are concerned about efforts to cap the Red Penn toxic waste landfill in Pewee Valley, Kentucky. My constituents are worried that the cap will only postpone the inevitable leakage of toxic waste into the surrounding residential and farmland area. An area which includes nearby creeks where children play and animals drink. They have requested that the EPA investigate their concerns before continuing with the implementation of the site cover.

I would like to take this opportunity to express my interest in this situation and ask that I be provided with information upon which to base a reply to my constituent. Please respond to my Fort Mitchell District office.

Best wishes and thank you for your consideration.

Sincerely,

Ken Lucas
Member of Congress

KL:sb

5 9 0088

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

JUN 19 2000

Honorable Ken Lucas
Member, United States
House of Representatives
277 Buttermilk Pike
Fort Mitchell, KY 41017

Dear Congressman Lucas:

Thank you for your letter dated May 12, 2000, regarding the Red Penn Landfill in Pewee Valley, Kentucky. I am pleased to provide this response to address your constituents' concerns relative to the on-going remedial action at the site.

The Red Penn Landfill was a permitted household waste disposal facility which operated from 1954 to 1986, and accepted unauthorized industrial waste. The abandoned landfill was declared a federal Superfund site in 1989, under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). EPA conducted a remedial investigation of the site and concluded in 1993, that the landfill did not pose sufficient human health or environmental risk to warrant a federal Superfund cleanup action. Nevertheless, the facility required proper closure. Consequently, EPA advised the Kentucky Department of Environmental Protection (KDEP) to work directly with the responsible parties on closing the landfill properly. In 1994, KDEP began site clean-up negotiations with the responsible parties. The negotiations resulted in an agreed order requiring Ford Motor Company, Waste Management of Kentucky, Red Penn Sanitation Company, the former owners/operators of the landfill (John Redmon, Guy Redmon and John Guelda) and the Atlantic Richfield Company to clean the site.

The agreed order requires the principal responsible parties to construct an engineered impermeable protective cap over the entire extent of the landfill. The cap will consist of a geosynthetic clay liner, a drainage net, and an eighteen inch soil cover with approved vegetation to control surface water runoff and prevent infiltration of water. It is designed to eliminate the potential for continued migration of contaminants from the landfill into the environment. Clearing and grubbing, the initial phases of the construction, are currently underway, and the total cap installation work is scheduled to be completed by the end of November 2000.

Under the agreed order, the responsible parties will monitor the protective cover in perpetuity. In addition, they are required to sample surface water and groundwater quarterly to ensure that the cap effectively prevents offsite migration of contaminants. If the results of these activities indicate that the implemented remedy is not effective, further remedial action will be required by the KDEP.

EPA evaluated the proposed remedy and concluded that the project as designed includes sufficient measures to result in an effective resolution of the environmental issues at the site. I assure you that EPA is interested in mitigating unacceptable human health and environmental risks at the Red Penn Landfill. We will continue to review information on the site to ensure that the remedy under construction is effective. As provided for by the CERCLA, EPA will take an appropriate action or require further cleanup activities at the site if future conditions so indicate.

If I may be of further assistance, please feel free to contact me or the Office of External Affairs at (404) 562-8327.

Sincerely,

John H. Hankinson, Jr.
Regional Administrator

cc: Jeff Pratt w/ incoming letter
KDEP

5 9 0090

June 12, 2000

Environmental Protection Agency
Region IV
Atlanta, Georgia

Re: Redd-Penn Landfill

The Redd-Penn Landfill located in Oldham County near Pewee Valley is a topic that is most frightening to those of us who live anywhere nearby.

The cancer victims in the area are becoming so numerous and we feel we have a right to be concerned.

Please, do whatever you can to help REMOVE these toxic wastes, instead of CAPPING; not only for us, but for future generations.

Respectfully.
Virginia H. Chaudoin

Virginia H. Chaudoin
P.O. Box 444
Pewee Valley, Ky. 40056

5 9 0091

April 23, 2000
Pewee Valley, KY

The Environmental Protection Agency
Region IV
Atlanta, GA

Dear Editor:

The plan to cap the Red Penn toxic waste, landfill is woefully inadequate. To even suggest that it will solve the problem is ludicrous. The cap will only postpone the inevitable leakage of toxic waste into the surrounding area. There is no question that it will eventually happen. The very idea that we would knowingly leave this poison catastrophe for our children and possibly their children is unconscionable. I really don't know who made this deal for the community, but whoever it was should go back to the drawing board and vehemently insist that the toxic waste be removed from the area and disposed of properly.

Sincerely,

Clayton Stoess, Jr.

5 9 0092

June 12, 2000

Environmental Protection Agency
Region IV
Atlanta, Georgia

Re: Redd-Penn Landfill

As you know there are plans to "CAP" the Redd-Penn Landfill in Oldham County. In view of the extremely hazardous waste involved, I feel this would be a very big and costly mistake.

I would appreciate your investigating this plan THOROUGHLY before giving your approval since the health of so many people, especially little children, is involved.

A thorough CLEAN-UP would be very expensive, but in the longrun would save money as well as lives.

Respectfully,
Louise H. Marker

Louise H. Marker
P.O. Box 54
Pewee Valley, Ky. 40056

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

5 9 0093

June 20, 2000

Subject: Red Penn Landfill Site
Pewee Valley, Kentucky

From: Femi Akindele

To: Ms. Louise H. Marker
P. O. Box 54
Pewee Valley, KY 40056

As the EPA Remedial Project Manager for Red Penn Landfill Site, a copy of the memo you recently wrote regarding the landfill cap under construction at the site was forwarded to me. The attached letter from our Regional Administrator to Congressman Ken Lucas may be of interest to you as it addresses concerns similar to yours.

As the letter states, EPA believes that capping the site will address site issues adequately, based on current information. If new information indicates otherwise, EPA will take appropriate actions.

Thank you very much.

Sincerely,

Femi Akindele

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

5 9 0094

June 20, 2000

Subject: Red Penn Landfill Site
Pewee Valley, Kentucky

From: Femi Akindele

To: Ms Virginia H. Chaudoin
P. O. Box 444
Pewee Valley, KY 40056

As the EPA Remedial Project Manager for Red Penn Landfill Site, a copy of the memo you recently wrote regarding the landfill cap under construction at the site was forwarded to me. The attached letter from our Regional Administrator to Congressman Ken Lucas may be of interest to you as it addresses concerns similar to yours.

As the letter states, EPA believes that capping the site will address site issues adequately, based on current information. If new information indicates otherwise, EPA will take appropriate actions.

Thank you very much.

Sincerely,

Femi Akindele

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

5 9 0095

June 20, 2000

Subject: Red Penn Landfill Site
Pewee Valley, Kentucky

From: Femi Akindele

To: Mr. Clayton Stoess, Jr.
Pewee Valley, KY 40056

As the EPA Remedial Project Manager for Red Penn Landfill Site, a copy of the memo you recently wrote regarding the landfill cap under construction at the site was forwarded to me. The attached letter from our Regional Administrator to Congressman Ken Lucas may be of interest to you as it addresses concerns similar to yours.

As the letter states, EPA believes that capping the site will address site issues adequately, based on current information. If new information indicates otherwise, EPA will take appropriate actions.

Thank you very much.

Sincerely,

Femi Akindele